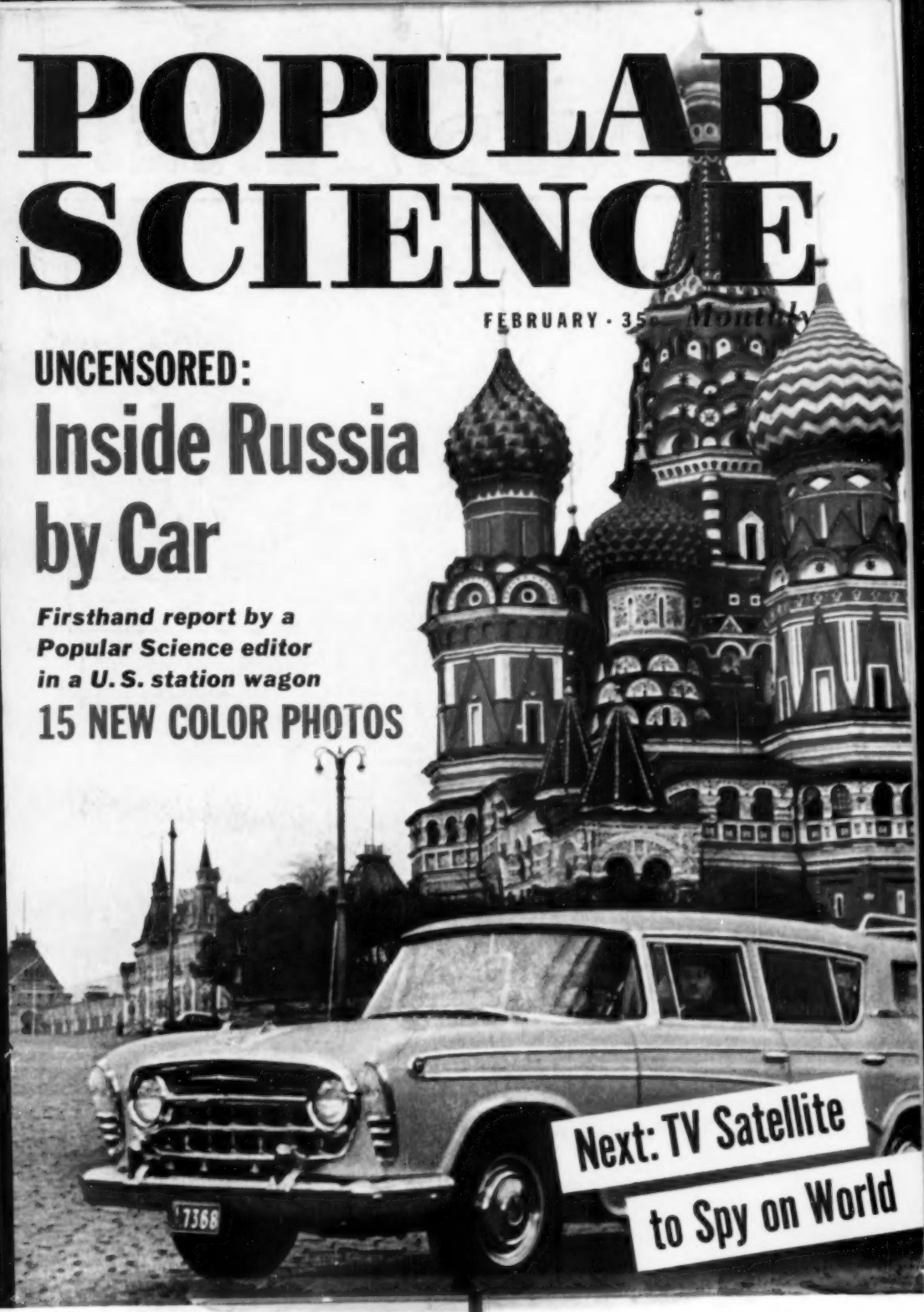
POPULAR SCIENCE

FEBRUARY · 35¢ Monthly

UNCENSORED:
Inside Russia by Car

Firsthand report by a Popular Science editor in a U. S. station wagon

15 NEW COLOR PHOTOS



Next: TV Satellite to Spy on World

BURIED ALIVE!

SIX YEARS ON THE SAME JOB WITH NEVER AN ACCIDENT... AND THEN ONE MORNING...

FREE!

I.C.S. CAREER KIT

Send coupon now... get all three books

INTERNATIONAL CORRESPONDENCE SCHOOLS
BOX 21314B SCRANTON 15, PA.

1 "HOW TO SUCCEED"
A 32-page gold mine of ideas

2 CAREER CATALOG
Opportunities in the field that interests you most

3 SAMPLE LESSON (MATH)
Shows the famous step-by-step I. C. S. teaching method

For Real Job Security—Get an I. C. S. Diploma! I. C. S., Scranton 15, Penna.

Accredited Member, National Home Study Council

INTERNATIONAL CORRESPONDENCE SCHOOLS

ICS

BOX 21314B, SCRANTON 15, PENNA. (Partial list of 257 courses)

Without cost or obligation, send me "HOW to SUCCEED" and the opportunity booklet about the field BEFORE which I have marked X (plus sample lesson):

ARCHITECTURE and BUILDING CONSTRUCTION
- ☐ Air Conditioning
- ☐ Architecture
- ☐ Arch. Drawing and Designing
- ☐ Building Contractor
- ☐ Building Estimator
- ☐ Carpentry and Millwork
- ☐ Carpenter Foreman
- ☐ Heating
- ☐ Interior Decoration
- ☐ Painting Contractor
- ☐ Plumbing
- ☐ Reading Arch. Blueprints

ART
- ☐ Commercial Art
- ☐ Magazine & Book Illus.
- ☐ Show Card and Sign Lettering
- ☐ Sketching and Painting

AUTOMOTIVE
- ☐ Automobiles
- ☐ Auto Body Rebuilding and Refinishing
- ☐ Auto Engine Tuneup
- ☐ Auto Technician

AVIATION
- ☐ Aero-Engineering Technology
- ☐ Aircraft & Engine Mechanic

BUSINESS
- ☐ Accounting
- ☐ Advertising
- ☐ Business Administration
- ☐ Business Management
- ☐ Cost Accounting
- ☐ Creative Salesmanship
- ☐ Managing a Small Business
- ☐ Professional Secretary
- ☐ Public Accounting
- ☐ Purchasing Agent
- ☐ Salesmanship
- ☐ Salesmanship and Management
- ☐ Traffic Management

CHEMICAL
- ☐ Analytical Chemistry
- ☐ Chemical Engineering
- ☐ Chem. Lab. Technician
- ☐ Elements of Nuclear Energy
- ☐ General Chemistry
- ☐ Natural Gas Prod. and Trans.
- ☐ Petroleum Prod. and Engr.
- ☐ Professional Engineer (Chem)
- ☐ Pulp and Paper Making

CIVIL ENGINEERING
- ☐ Civil Engineering
- ☐ Construction Engineering
- ☐ Highway Engineering
- ☐ Professional Engineer (Civil)
- ☐ Reading Struc. Blueprints
- ☐ Structural Engineering
- ☐ Surveying and Mapping

DRAFTING
- ☐ Aircraft Drafting
- ☐ Architectural Drafting
- ☐ Drafting Machine Design
- ☐ Electrical Drafting
- ☐ Mechanical Drafting
- ☐ Sheet Metal Drafting
- ☐ Structural Drafting

ELECTRICAL
- ☐ Electrical Engineering
- ☐ Elec. Engr. Technician
- ☐ Elec. Light and Power
- ☐ Practical Electrician
- ☐ Practical Lineman
- ☐ Professional Engineer (Elec)

HIGH SCHOOL
- ☐ High School Diploma
- ☐ Good English
- ☐ High School Mathematics
- ☐ Short Story Writing

LEADERSHIP
- ☐ Industrial Foremanship
- ☐ Industrial Supervision
- ☐ Personnel-Labor Relations
- ☐ Supervision

MECHANICAL and SHOP
- ☐ Diesel Engines
- ☐ Gas-Elec. Welding
- ☐ Industrial Engineering
- ☐ Industrial Instrumentation
- ☐ Industrial Metallurgy
- ☐ Industrial Safety
- ☐ Machine Design
- ☐ Machine Shop Practice
- ☐ Mechanical Engineering
- ☐ Professional Engineer (Mech)
- ☐ Quality Control
- ☐ Reading Shop Blueprints
- ☐ Refrigeration and Air Conditioning
- ☐ Tool Design ☐ Tool Making

RADIO, TELEVISION
- ☐ General Electronics Tech.
- ☐ Industrial Electronics
- ☐ Practical Radio-TV Eng'g
- ☐ Practical Telephony
- ☐ Radio-TV Servicing

RAILROAD
- ☐ Car Inspector and Air Brake
- ☐ Diesel Electrician
- ☐ Diesel Engr. and Fireman
- ☐ Diesel Locomotive

STEAM and DIESEL POWER
- ☐ Combustion Engineering
- ☐ Power Plant Engineer
- ☐ Stationary Diesel Engr.
- ☐ Stationary Fireman

TEXTILE
- ☐ Carding and Spinning
- ☐ Cotton Manufacture
- ☐ Cotton Warping and Weaving
- ☐ Loom Fixing Technician
- ☐ Textile Designing
- ☐ Textile Finishing & Dyeing
- ☐ Throwing
- ☐ Warping and Weaving
- ☐ Worsted Manufacturing

Name _____ Age _____ Home Address _____

City _____ Zone _____ State _____ Working Hours _____ A.M. to P.M. _____

Occupation _____

Canadian residents send coupon to International Correspondence Schools, Canadian, Ltd., Montreal, Canada. . . . Special tuition rates to members of the U. S. Armed Forces.

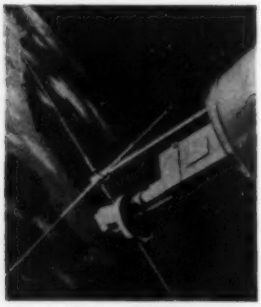
Founded in 1872 Vol. 172: No. 2 *Mechanics and Handicraft* REG. U.S. PAT. OFF.

Popular Science Monthly

February, 1958

Cover photograph by Harry Walton

What's this man doing? Looking for spies. Here's the inside story of espionage in Detroit



Now U.S. scientists hope to rocket into space a see-all, know-all TV eye. Target date: any time . . . soon

15-PAGE COLOR SECTION

PS Eyewitness Report:
Inside Russia by Car · 90

AUTOMOBILES

Thunderbird Now Totes Four · 118
Chrysler 300D Has Built-In Roar · 122
How Auto Makers Spy on Each Other · 133
What's Your Driving IQ? · 211

PS SHOPPING REPORTS

The Right Battery for Your Car · 172
What's New
- For Your Car · 180
- For Your Leisure Hours · 181
- For Your Home · 182
- For Your Home Shop · 183
- For the Home Handyman · 183

WORLD OF SCIENCE AND INDUSTRY

TV Satellite to Watch the World · 105
Will the Sun Heat Your Next House? · 110
The Robot That Runs a Railroad · 114
Hot-Water Heat Without Radiators · 124
The Building One Man Can Carry · 130
What Science Knows About Headaches · 137
How We May Get H-Power · 164

Editor: HOWARD ALLAWAY

Managing Editor
FRANK ROWSOME JR.

Assistant Managing Editors
Charles M. Garvey
Kendall W. Goodwyn
Robert P. Stevenson

Senior Editors
Devon Francis
Martin Mann
Everett H. Ortner
Harry Walton

Technical Editor
Hubert Luckett

West Coast Editor
Wesley S. Griswold

Associate Editors
Erik H. Arctander
Alden P. Armagnac
Henry B. Comstock
Frank Dorr
Sheldon M. Gallager
Herbert O. Johansen
Herbert R. Pfister
Maryann Smith
Ruth Westphal
Richard A. Yahraes

Editorial Assistants
Rosa Lee Beeland (Chief)
Annette Krauss (Research)
Anna Dallas, Bebe Lipson,
Roberta Marks, Georgette Sparks

Art Director
HOWARD C. JENSEN

Art Editors
Herbert Anthony
Reginald A. Hawley
Harry Samuels

Art Associates
Al Heighington
Eric A. Karminski Jr.
Henry W. Kazmirowski
Richard J. Meyer
Dana B. Rasmussen

Photography
W. W. Morris (Chief)
Robert D. Borst
Orlando Guerra

America's Leading New-Idea Magazine for 86 Years

SPECIAL FEATURES

Correspondence Schools: Plain Facts · 126
Biggest Boom in Music · 156
I Flew 1,900 M.P.H. · 160
What Can You Pay for a House? · 194
Gus Gives a Competitor the Business · 218
Transistors Power Servo-System Hi-Fi · 222

THE NEWS IN PICTURES

Jet-Age Air Terminal Is Soundproofed · 142
New Hull Makes Copter Amphibious · 149
Development House Has Indoor Pool · 150
He Boils Metal to Get Electricity · 155

FOR HOME AND SHOP

Home Incinerators Burn Their Smoke · 177
Four Bargain Tables from Flush Doors · 184
Light Your Home with Remote Switches · 189
PS Fix-It File: Tool Handles · 199
Wordless Workshop · 202
The Remedy for TV Interference · 204
Short Cuts and Tips · 223

Take off with Lt. Col. Frank K. Everest Jr.—"the fastest man alive"—for a record-shattering assault on time and space

Choose the table you like, build it in one evening. Cost: low. Materials: simple stock lumber and a flush door

Another PS exclusive: Monthly price reports on things you buy

For the honest retail prices of the things you buy, read the new Popular Science Price Report. It tells you what to buy, when to buy, what to pay. Check it this month and every month in: You Ought to Know · Page 21

Publisher
RALPH H. FLYNN

Advertising Manager
LEE P. ADAMS

Circulation Director
EUGENE WATSON

EDITORIAL OFFICES:
353 Fourth Ave., New York 10, N.Y.

ADVERTISING OFFICES:
NEW YORK—353 Fourth Ave.
CHICAGO—360 North Michigan Ave.
DETROIT—820 Book Bldg.
SAN FRANCISCO—114 Sansome St.
CLEVELAND—636 B. F. Keith Bldg.
LOS ANGELES—1127 Wilshire Blvd.
PORTLAND, ORE.—520 S.W. Sixth Ave.

SUBSCRIPTION SERVICE:
Address all subscriptions and correspondence concerning them to: Subscription Department, 353 Fourth Ave., New York 10, N. Y. Allow four weeks' notice for change of address. Please give both old and new addresses, including zone numbers.

Published monthly at 353 Fourth Avenue, New York 10, N. Y., by Popular Science Publishing Co., Inc., Godfrey Hammond, Chairman of the Board; Ralph H. Flynn, President and Treasurer; Franklin E. Parker Jr., Secretary; Eugene Watson, Vice-President. Second-class mail privileges authorized at New York, N. Y., and Dayton, Ohio. Entered as second-class matter at the Post Office Department, Canada. Printed in U.S.A.

Copyright, 1958, by Popular Science Publishing Co., Inc. All rights reserved in the United States, Great Britain, and in all the countries participating in the International Copyright Convention and Pan-American Copyright Convention.

Single copy 35c. Subscriptions to United States, its possessions, and Canada, 1 year $3.40 (2 years $6.00, 3 years $8.00). Elsewhere, 1 year $6.00 (2 years $11.00, 3 years $16.00).

PS Readers

TALK BACK

For Better Science Labs

YOUR article, "How Good Are the Science Labs in Your Youngster's School?" [Nov.], should be of assistance to schools and teachers who are trying to improve their lab facilities.

Since it is directed to parents, it should reach an important audience. It is well known that schools can have what their communities want them to have.

We are pleased that you saw fit to give space in POPULAR SCIENCE to this topic.

JOHN R. MAYOR, Director
Amer. Ass'n for the Advancement of Science, Washington, D. C.

. . . The lack of up-to-date science equipment in high schools, noted in your article, is obviously not going to be solved with one sweep of a wand.

But I wonder why science teachers have not made more use of film to teach

difficult concepts? Film strips can bring the equivalent of thousands of dollars' worth of apparatus into the classroom. Science educators should stop considering film strips a class respite or entertainment. Used side by side with textbooks, they can do a wonderful job of teaching science —without expensive equipment.

H. M. STONE, NYC

Running TV Chassis into the Ground

YOUR suggested safety check for TV sets, to insure that the neutral house wire goes to the chassis ["You Ought to Know," Oct.], was good, but I'd like to add a point.

The screw in the outlet cover is not always at ground potential. Often, in home wiring, the metal box, screw and plate are floating with no ground connec-

tion at all. This could lead a well-meaning but uninformed person into a feeling of security where none exists.

Most neon voltage testers will indicate the hot side by a glow when one tip is held in the fingers and the other is applied to the receptacle holes—and no harm will come to the person holding it.

L. D. BOYLES, Portland, Ore.

Good point. Metal outlet boxes should be grounded but often are not. Connect the tester between the chassis and a ground point that will make the neon glow brightly for one position of the plug. Then reverse the plug. *Leave the plug in the position that does* not *produce a glow. Even this method is not foolproof. Some sets will check okay when turned on, but check hot when turned off. The only solution here is to orient the plug properly when the set is on and pull the plug when it is off.*

Back-Seat Lament for '58 Car

THOSE gleaming '58 vehicles in your recent issues look good in four-color pictures, but brother, they don't feel so good. We just got home from a 2,000-mile jaunt in a friend's new car. Its owner (bemused by his privilege of paying $80 a month for 36 months) thought it behaved fine. My wife and I thought the old sedan in our garage at home—roomy, reliable and paid for—never seemed sweeter.

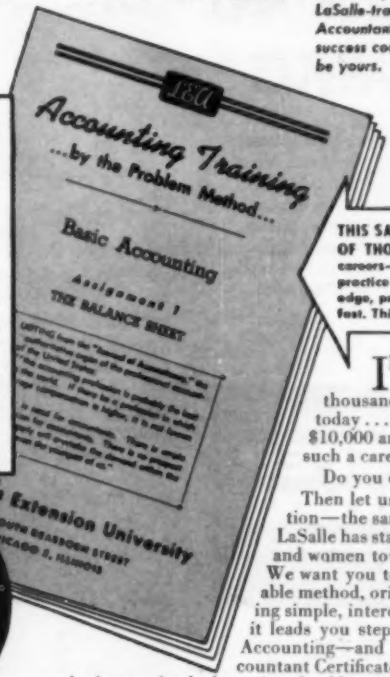
The '58s just don't make *any* sense. This convertible we rode in was about 18 feet long and had a trunk big enough to hold a spinet—but there wasn't enough room in the back seat for human beings over the age of 10. Some "sales engineer" had padded the instrument panel—but left untouched two lethal roof latches on

THIS FREE SAMPLE LESSON

will prove that you can become an expert

ACCOUNTANT...AUDITOR OR CPA

This well-paid LaSalle-trained Accountant's success could be yours.



FREE SAMPLE LESSON

We offer you this free sample lesson so that you can *prove to yourself* that you CAN master Accounting—quickly, thoroughly—in spare time at home.

You will see exactly how LaSalle's famous "Problem Method" works...how you are led step-by-step through actual accounting work—*learning by doing* and not by study of theory alone. First you tackle easy problems, then more difficult ones—until soon you master them all. And at every step you have the close personal guidance of LaSalle's large staff of expert accountants and CPA instructors.

THIS SAME LESSON HAS STARTED HUNDREDS OF THOUSANDS toward well-paid accounting careers—in business, government, and public practice as CPAs. Even without previous knowledge, progress is rapid—earning power climbs fast. This sample lesson will show you why.

One out of every 13 of all CPAs in the U.S. has been trained by the LaSalle Problem Method

IF you have been envying the high incomes and good jobs enjoyed by thousands of men and women Accountants today... incomes ranging from $5,000 to $10,000 and more per year... why not launch such a career for yourself?

Do you doubt that you can?

Then let us send you—without cost or obligation—the same Lesson Number One with which LaSalle has started several hundred thousand men and women toward successful accounting careers. We want you to see for yourself how this remarkable method, originated by LaSalle, makes Accounting simple, interesting, practical, and certain... how it leads you step-by-step to a complete mastery of Accounting—and on up to the Certified Public Accountant Certificate if you so aspire. It doesn't matter whether you've had previous bookkeeping experience, or whether you don't know a debit from a credit. Whether you wish to qualify as an expert accountant, advanced accountant, cost accountant, auditor, government accountant, income tax specialist, or public accountant... you'll find in LaSalle's Problem Method the exact plan to prepare you rapidly and inexpensively—in spare hours at home—without losing a day from your present job.

So right now, today... if you are an adult, employed, and earnestly ambitious for rapid advancement in one of the highest paying fields of business... send your name and address on the coupon below. We'll send you the free sample lesson—plus our illustrated book outlining today's career opportunities and how you can qualify for them. A coupon like this has started many thousands toward greater success. It can do the same for you. Mail it today!

Accredited Member, National Home Study Council

GOOD-PAY JOBS IN 6 BIG FIELDS

If you were an expert accountant right now, chances are you would find yourself in one of the best paid fields of business.

There are several big fields of opportunity open to men and women trained in accounting...opportunities that are wide open and highly inviting, offering maximum income and job security in good times or bad. And under LaSalle's "Problem Method" you can start earning while still learning—either in spare-time or full-time employment...or in business for yourself with no capital required.

Get the latest information by sending for our illustrated booklet, "Opportunities in Accounting"—plus free sample lesson. The coupon at right will bring both to you without cost or obligation. LaSalle Extension University, 417 S. Dearborn St., Chicago 5, Illinois.

Clip Coupon ... Mail TODAY!

LaSalle Extension University ... *A Correspondence Institution*

Dept. 283H, 417 S. Dearborn Street, Chicago 5, Illinois

YES, I want to see how LaSalle's "Problem Method" works... Send me free sample lesson—also your book, "Opportunities in Accounting"... without cost or obligation.

Name.....*Age*.....

Street Address.....

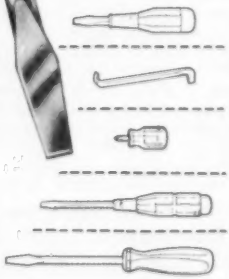
City, Zone & State.....

BIG COMFORTABLE HANDLES

Proto "BET'R-GRIP"® screwdriver handles give you extra gripping power, reduce fatigue. Result: more work with less effort.

ANOTHER REASON YOU'LL
PREFER PROTO PROFESSIONAL SCREWDRIVERS

Long, short or special types—you'll find exactly the screwdriver you want in the big Proto Line.



Proto screwdrivers are precision-designed, built to last longer. The alloy steel blades are heat treated their entire length. Plastic handles have extra deep flutes to prevent slippage and rolling. Wood handles are octagon shaped for sure grip, made of tough hardwood and (in most cases) protected by a ferrule and steel cap. At your dealers, be sure to pick Proto screwdrivers—they'll make your work easier. Send 10¢ for 84 page catalog describing entire line to Proto Tools, 2222 Santa Fe Ave., Los Angeles 54, Calif.

PROTO TOOLS
PROTO MEANS PROFESSIONAL TO
® REGISTERED U. S. PAT. OFF.
PENDLETON TOOL INDUSTRIES INC.
DIVISION OF

the windshield header. And the bolt-studded steel top supports, by the rear seats, were just three inches away from your temples.

Acceleration was terrific—and so was brake fade. After parking, we found that getting out was no harder than escaping from a sunken sub, except that you didn't need a Momsen lung. Two tall, raked antennas sprouting from the rear deck made us look as if we were cruising offshore for

tuna. On the seat backs inside, on the stunning gold-and-silver metallic upholstery, were decorative enameled buttons the size of walnuts. These shortly produced identical-sized bruises on passengers' backs. This kind of idiocy can *only* be explained by my theory that a bunch of appearance-crazy designers have taken over in Detroit.

R. L. Hale Jr., Lake Charles, La.

Gus Makes Problems in Far East

In the August Model Garage story, Gus speaks about a possible frozen wheel-cylinder piston, so it must be freezing cold. But the picture shows the men in summer clothes. Besides, the heat generated by the shorted stoplight would warm the cold master-cylinder housing.

Further, Gus says the shorted switch made the brake fluid boil. Then how could the pedal plunk to the floor without any effect? All four brakes would be blocked because of the expanding action of the boiling fluid. The brake pedal would certainly not plunk to the floor.

I have never met a case like this, and in my opinion one will never occur.

R. Woerisman
Keajoran, Indonesia

Please excuse Gus's use of Yankee trade lingo. To American mechanics, a "cocked and frozen" wheel-cylinder piston means a piston stuck in the cylinder for mechanical reasons, not one literally frozen by the outside temperature.

Air in a brake line will cause brake failure when compressed so that it doesn't transmit the full effort applied to the

Train at Home for SUCCESS in RADIO-TELEVISION

You Learn at Home by Actual Practice

With NRI kits you build actual Radio-TV circuits and testing instrument. Practice locating and fixing Radio-TV troubles. Learn soon to earn extra money.

Good Jobs in Radio-TV Communications

NRI trained men hold good jobs as operators and technicians in Radio and Television broadcasting stations, with Police, Marine and Aviation stations. Interesting work, good pay.

There's Good Pay in Radio-TV Servicing

NRI trained technicians are needed, paid well, to help maintain 150 million home and auto Radios, 38 million TV sets. Color TV, Hi-Fi adding opportunities. Excellent field for spare time earning.

Join the thousands N.R.I. has trained for Successful Careers in Radio-TV

J. E. Smith
Founder

Get the benefit of NRI's 40 years experience training men for success in this field. Get personal attention of experienced instructors. Also get practice with Radio-TV equipment—learn by *doing*—with kits supplied as part of your course. Courses are easy to learn. Most successful NRI men start without any knowledge of Radio, many without a high school education.

Find Out What Radio-Television Offers You

As a trained Radio-TV Technician, you are prepared to supply much needed services. The technician is a respected and appreciated member of his community. Get Sample Lesson FREE. See how practical NRI has made learning at home. Mail the coupon. You also get 64-page Catalog telling about NRI, the lessons, equipment supplied, instruction services.

N.R.I. TRAINED THESE MEN FOR SUCCESS

"I am a police captain and have a good spare time Radio-TV service business. Just opened new shop." C. W. LEWIS, Pensacola, Fla.

"Received my License and worked on ships. Now Chief Engineer Station WAPA. Grateful to N.R.I." R. D. ARNOLD, Rumford, R. I.

"Enrolled while meat market manager. Got serviceman job. In a year my pay increased 50%." C. CARTER, San Bernardino, Calif.

"Have a Radar job. Also do spare time Radio-TV servicing. Have my own amateur Radio station." F. ZAWAKE, Scranton, Penna.

Added Income Soon—$10, $15 a Week in Your Spare Time

Soon after enrolling, many NRI students earn $10, $15 a week extra fixing sets in spare time. Vacuum Tube Voltmeter you build with parts we send helps you locate and fix troubles. Special lessons show you how. Many students use spare time earnings to pay for their training, and provide capital to start their own businesses when they get NRI Diploma.

Color TV Making More Jobs

Radio-Television is an industry noted for continued and spectacular growth. Number of trained men employed has increased each year. Color TV and Hi-Fi are late developments creating need for more technicians. The future is very bright for trained men. Find out how you can get ready at low cost, on easy terms. Send for FREE Sample Lesson and Catalog. Mail coupon—National Radio Institute, Dept. 8BB, Washington 16, D. C.

VETERANS—Approved under GI Bills

Send for Sample Lesson and Catalog FREE

MAIL COUPON TODAY

NATIONAL RADIO INSTITUTE
Dept. 8BB, Washington 16, D. C.

Mail me Sample Lesson and 64-Page Catalog, FREE. (No Salesman will call. Please write plainly.)

Name_____Age____

Address_____

City_____Zone____State_____

ACCREDITED MEMBER NATIONAL HOME STUDY COUNCIL

Train at Home for a Top-Pay Job in AUTO MECHANICS

Skill adds many extra dollars to your pay check. This is especially true in the auto field, where *100,000 mechanics are needed.* Average pay in some areas is $3 per hour. It's easy to train at home in spare time for a secure job with a bright future, in America's No. 1 industry. *Mail coupon for full details.* No cost nor obligation.

Get Experience Using Tune-Up Kit & Tools

(included with training)

CTI sends you a Tune-Up Kit, the kind that skilled mechanics use to locate engine troubles. You receive a compression Tester; Vacuum Gauge & Fuel Pump Tester; Ignition Timing Light; portable steel case. You also get mechanic's tools, including socket set. You acquire *experience* using kits.

DIESEL MECHANICS OR BODY-FENDER REBUILDING

is yours at no extra cost. Only CTI offers this *extra* choice. You get fully-rounded training in all phases of mechanics.

Many Students Earn Money as They Train

by taking part-time jobs *in* local shops or fixing cars "on their own." Many make enough to pay all tuition and buy extra equipment. Some open shops, become independent.

Get Facts Now—Decide Later

Your future is worth looking into. Get facts on job and business opportunities. Mail coupon today—Commercial Trades Institute, Chicago 26, Ill.

MAIL TODAY FREE BOOKLETS

COMMERCIAL TRADES INSTITUTE

1400 GREENLEAF AVENUE
CHICAGO 26, ILLINOIS DEPT. A-739

Send booklet, *Big Money in Auto Mechanics,* and *Sample Lesson.* Both are FREE.

Name_____ Age_____

Address_____

City_____ Zone____ State_____

brake pedal. Boiling brake fluid creates gas or vapor in brake lines, and this acts like air in reducing brake action.

PS Booklet Used as Textbook

YOUR booklet, "What to Do When Your Car Conks Out" [July], is proving to be a valuable aid to us in our auto shops. This is especially so in the light of our objective: to make the student a future intelligent user of the automobile. The well-illustrated articles in this pamphlet, dealing with the auto failures most frequently encountered, have served to stimulate the students in their work.

JOSEPH J. PORTLE, Principal
Washburn Voc. H. S., Chicago

Decimal Point Lowers Wow

SOMEHOW or other, in submitting the data on flutter and wow on our model 1960 recorder, we neglected to put a decimal point in front of the numeral three. Thus in your chart covering tape recorders [Nov.], instead of reading .3%, it appears as 3%. I do hope a correction can be made somewhere in your pages.

DAVID LIBSOHN, Telectrosonic Corp.,
Long Island City, N. Y.

Feeding the Free-Piston Engine

READING your article on the free-piston engine back in September raised a question in my mind that I've been unable to solve to this day. Can you help me?

In a conventional diesel engine, fuel must be injected in the proper amount at the precise moment. How is this accomplished in a diesel free-piston job when there is no positive mechanical movement to actuate the injector?

WILLIAM M. FULLER, San Antonio

Ford engineers explain: The fuel pump on their free-piston engine is driven by the oscillating synchronizing gear. (The engine has no rotating parts to drive the pump.) The synchronizing gear oscillates from standstill to maximum velocity at about midpoint of piston travel. At this maximum piston velocity, the injection pump feeds fuel to the fuel line. But the line is coiled and 15 feet long, so fuel delivery at the nozzles is delayed until at or near inner dead point of piston travel.

Learn at Home IN YOUR SPARE TIME to Fix Electrical Appliances

To build a better future, get into a field where there's much important work and the security that comes from knowing a good trade. Servicing electrical appliances offers that OPPORTUNITY. Every wired home has an average of 8 electrical appliances. Up to 10 million new appliances are sold every year and owners pay well to keep them in repair. That's making a fast-growing need for trained men.

Start Soon to Earn $3, $4, $5, an Hour Extra in Your Spare Time

Start soon to fix electric toasters, clocks, fans, vacuum cleaners and other appliances for neighbors and friends. Work in your basement, garage or spare room. Pick up $3 to $5 an Hour *extra that way*. It's easy to increase your earning power—to pay for this training many times over with your spare time earnings.

Learn and Earn with Multi-Use Tester Built with Parts We Send

This course includes the parts to build a portable, sturdy Appliance Tester that helps you locate electrical defects quickly and easily. You use it to learn and do actual electrical appliance repair jobs. If you want better pay learn this good trade. No need to give up your present job. You can train at home in your spare time for only $2.50 down and $5.00 a month. A small price to pay for increased earnings, a more secure future. Paste coupon below on a 2c postal or mail in envelope for free book and sample lesson. Address **National Radio Institute, Dept. BBB, Washington 16, D. C.**

2c TO MAIL THIS COUPON MAY START YOU TO SUCCESS

LESSON AND BOOK FREE

NATIONAL RADIO INSTITUTE, Dept. BBB, Washington 16, D. C.

Please send me Electric Appliance Training lesson and book free. (No salesman will call.)

Name.....Age.....

Address.....

City.....Zone....State.....

ACCREDITED MEMBER NATIONAL HOME STUDY COUNCIL

Selling Stock At Sacrifice!

NEVER BEFORE SUCH LOW PRICES!

Clearing out $210,000 worth of stock at sacrifice prices. All new, first-quality merchandise. This is our famous January clearance—which means LOWEST PRICES YET! Stock up now. First come, first served. Your money back if you're not satisfied. Rush coupon below for PROMPT service. THORESEN, Inc., Dept. 7-B, 585 Water Street, New York 2, N. Y.

Price Slashed!

BEAUTIFUL NEW ZEPHIR ONE OF THE WORLD'S THINNEST TIMEPIECES

REGULAR PRICE! 7.98

5.99 PLUS TAX

Even at this low price you get famous Thoresen Unlimited Guarantee of free service, free annual oiling, free adjustments for lifetime of firm!

- ★ Looks Like $75.00 Watch
- ★ 14 Karat Gold Color
- ★ Raised Gilt Hands and Numerals
- ★ New 1958 Model from Switzerland

Here's the most fabulous watch value in America. Famous Zephir ultra-thin watch—25,000 recently sold at $7.98—reduced again to only $5.99 plus tax for QUICK SELL-OUT! This is the new 1958 model, perfect in every detail; described by customers in words like these: "A rare jewel!" . . . "My friend thought I paid at least $50.00 for it!" . . . "Keeps accurate time!" 14 karat gold color. Raised gilt hands and numerals. Precision Swiss import. Beautiful leather strap. This is a TEMPORARY price reduction to win new customers. (Price subject to change without notice.) Don't lose out on this sensational value. NO. 210 5.99 plus 60c Federal tax. TOTAL: 6.59 Special! Save $3 on DeLuxe Model with 14 Karat Gold color expansion band. Thousands sold at $10.99—yours for 7.99 tax-paid. NO. 210D.

POCKET WATCH

ONLY **2.98**

No fancy diamond dial or wafer thin case; no alligator or golden band, no plush velvet gift box—and no fancy price tag either! Only $2.98 buys this rugged, old-fashioned railroad-type watch. If you want an old-timer that evokes interest—and keeps good time — buy this old "choo choo" watch. Guaranteed. NO. 251.....2.98

WATER & SHOCK Resistant Watch

7.77

RUNS UNDER WATER!

50,000 sold at higher prices—now only 7.77. Water and shock resistant. Built-in shock protector. Anti-magnetic. Stainless steel back. Sweep second hand. Luminous dial. Runs under water. Even if we charged TWICE the price, we couldn't give you a more accurate watch. Famous Thoresen Unlimited Guarantee of free service, oiling, adjustments for lifetime of this firm. No. 263 7.77 plus 78c Federal tax, TOTAL: 8.55 Special! Deluxe Model with metal expansion band. Reg. $11—only $10 tax paid. No. 263D

SWISS ARMY Type 10-in-1 Knife

50,000 Sold at $3.98

1.98

Big! 9 inches long when open. 10 practical tools in one. Saw, File, Corkscrew, Small Knife, Can Opener, Awl, Screwdriver, Utility Knife, Bottle Opener, Scissors. All easy to open & close. No jamming. No slipping. Replaces multitude of tools & gadgets can't find when needed. Rugged Korium steel. No. 18 . . . Now 1.98

SOLINGEN Stainless Steel Steak Knives

New Low Price **25c**

Fantastic value. Adv. in "House Beautiful," "TheAmericanHome" etc. One million sold at prices of 33c to $2.00 each. Now slashed to only 25c in lots of 4. New, first-quality. Gold & ivory blue handles. Breathtaking design. Stainless steel. Serrated edges never need sharpening. 10-year replacement Guarantee. No. 894 4 for $1. 8 for 1.98

1958 Powerhouse Giant

from West GERMANY Still Only **4.98**

New faster focus. New swirling pivot. New modern design. New case & straps. Best yet from West Germany. Every lens made by GRINDING. Get clearer sharper close-up views day or night. Our costs have risen 17%—yet new 1958 Powerhouse still only 4.98. Biggest binocular value in U.S.A. NO. 66. Case & straps included. 4.98

Black Forest Hunting Knife

Reduced Again!

88c

plus 12c for Sheath

Another price slash on the world's most popular hunting knife. 100,000 sold at $3.98. Thoresen cut price on replica $1.25. Now we cut price to only 88c plus 12c for sheath. Nearly 10 inches long. Nearly 10 inches long. You'll marvel at sculptured style of handle. A real champion. No. 76 . . . $1 complete

MAIL COUPON! MONEY BACK GUARANTEE

THORESEN, Inc., Dept. 7-B
585 Water Street, New York 2, N. Y.

Rush items below. My money back if I'm not satisfied.

NO.	QUANTITY	ARTICLE	PRICE

State Size & Color where necessary.
MINIMUM ORDER $2.98

☐ Check, money order or cash enclosed. Send prepaid
☐ Send COD Plus Postal fees

PRINT NAME _____
ADDRESS _____
TOWN OR CITY _____ STATE _____

Canadians: 439 King St. West, Toronto 2B, Ont.

"This Insulated Vest Feels Warmer than 10 Sweaters!"*

*writes one customer

DuPont Dacron Fiberfill Gives Warmth without Weight!

Adv. at $13.95

7.95

SAVE $6.00. New hunting vest with 3-ply insulation. Same vest featured in "Sports Afield" magazine recently at $13.95 — our price 7.95. Featherweight yet gives same protection as 10 sweaters—writes one customer. Extra-large zipper that can't freeze. Two huge roomy pockets with inside elastic shell loops. Washable. Dries fast. Keeps shape. Long fibered insulation by DuPont. Dustproof. Mothproof. Non-Allergic. Full purchase price refunded if you don't agree it's worth nearly TWICE the price. Red or Brown. Extra small (32-34); Small (36-38); Medium (40-42); Large (44-46); Extra Large (48-50). FREE 10-day trial. No. 53 . . . 7.95

The month in science

What price fuel economy? The faintly discernible trend toward more miles-per-gallon in U.S. cars could be reversed before it fairly gets moving. The reason, not strictly automotive: smog. Two classes of chemicals in auto exhaust are a major cause of smog: oxides of nitrogen, and unburned hydrocarbons.

GM researchers have now figured out one way to eliminate the nitrogen oxides—at least on new, top-tuned cars. Reset the carburetor to run rich all the time—at a loss of 26 percent in fuel economy.

Today's carbs, remarkably parsimonious with gas, are linked to the gas pedal to give a rich mixture (12:1 air-fuel ratio) for maximum power while accelerating, then lean out (16:1) for maximum economy at cruising. It's the economical cruise setting that causes the trouble: Nitrogen oxide formation hits a peak.

Road tests with a rich carb (11:1) showed these results:

- Driveability not affected.
- Nitrogen oxide reduced 90 percent overall, even more during part-throttle acceleration and 40-50-m.p.h. cruising, which produce the greatest amount of these gases.
- Gas mileage cut an average of 4.1 m.p.g. This adds about $70 a year to the fuel bill.
- Carbon monoxide output increased.
- Hydrocarbon output increased for some driving conditions, decreased for others. No clear-cut difference overall.

One problem they did not check on was maintenance. Will the rich mixture gum up the fuel-intake system, shorten valve and plug life? Another: How about older, detuned cars?

The GM research suggests these steps for a sweet exhaust:

- A compromise carburetor set at 12:1, eliminating 75 percent of nitrogen oxides while boosting your fuel bill $40 a year.
- Catalysts, in the muffler or inside the cylinders themselves, to burn off hydrocarbons and carbon monoxide.
- Super-premium fuels, which generate less smog but again add to your gasoline costs.

Still unanswered: Can U.S. motorists be persuaded—by social pressure or legal fiat—to pay for the accessories and inefficient operation that a clean atmosphere requires?

Too much radiation. Scientists' increasing concern about harmful effects of atomic rays has now brought government action, as PS forecast last December (p. 21).

AEC lowered the boom on permissible radiation to its employees, to people living near atomic plants, and—for the first time—to the population as a whole.

The reduction was drastic: 67 percent. Atom workers will now be permitted an average of no more than approximately five

roentgens a year (old limit: 15R.). Maximum exposure of other people was set at one-tenth that of atom workers.

And another step: Cut down on chest X rays to spot tuberculosis.

The U.S. Public Health Service recommended that health agencies stop mass programs intended to X ray everybody, use X rays only on people likely to have the disease.

For your next house: plastic plumbing. It's a good bet with a new type of plastic just now coming on the market.

Name: polypropylene. It looks and feels pretty much like polyethylene (the stuff used for squeeze bottles). The big thing is its heat resistance. It can stand boiling water, could easily handle a home hot-water supply—something polyethylene can't do.

Polypropylene results from a smashing breakthrough in the science of atom-juggling. Giulio Natta of the Milan Polytechnic Institute discovered catalysts that produce orderly (as opposed to random) long chains of molecules. The molecules join together, end-to-end, with their side branches lined up, all of one type on one side, all of another type on the other side. This orderliness is what makes the difference.

Polypropylene promises big things, beyond plumbing pipes. It is somewhat lighter, stronger and more rigid than polyethylene. It's cheap, made from propylene gas, a petroleum by-product. You'll see it as housewares, machine parts, fabrics, films.

Today's only polypropylene maker: Montecatini, Italian chemical combine that underwrote Professor Natta's research. But Hercules Powder has just begun work on a plant here.

Eddy currents in the kitchen. Latest switch in the continuing effort to electrify the cook is a really different kind of stove that has no heated elements, makes the pots heat themselves.

It works on eddy currents. A motor spins a magnetized wheel under the stove's surface. This creates a changing magnetic field which induces electricity in ordinary metal pots. Eddy currents are converted to heat by the resistance of the metal.

The new system claims impressive advantages:

- It cooks twice as fast as a standard electric range.
- The stove itself stays cool, which means that spills don't get baked on, are easily wiped off.
- Kitchen is cooler because practically all heat goes into food.
- Cooking unit can also power a mixer-blender—a glass jar containing a magnetic rotor agitated by the magnetic field.

Don't expect to buy one for a couple of years. Tuttle & Kift, Chicago stove-component manufacturer, just imported the invention (from Germany), is now trying to sell it to range makers.

Martin Mann

FREE FACTS FOR MEN 17–55!

Prepare In Spare Time For Profitable Jobs In . . .

ELECTRONICS

AS USED IN

GUIDED MISSILES

TELEVISION — RADAR — MICRO-WAVES, ETC.

No Advanced Education or Previous Technical Experience Required!

A man doesn't even have to know how to splice a lamp cord or use a soldering iron to be eligible to prepare in his spare time at home to enter the big opportunity field of Electronics. As a result, many laborers and bookkeepers, store clerks, shop men, farmers, and men of nearly every calling—have taken the DeVry Tech program, and today have good jobs or service shops of their own in Electronics.

Marvels of Electronics

Satellites, guided missiles, and other marvels made possible by Electronics bring us into a new era of wonderment and opportunity!

Employment Service

Puts you in touch with job opportunities—or helps you toward a better position in the plant where you are now employed.

Draft Age?

We have valuable information for every man of draft age; so if you are subject to military service, be sure to check the coupon.

KEEP YOUR JOB!

As you train for a good opportunity that pays real money in Electronics, you won't have to interfere with your present job. Your chances of preparing to enter Electronics need not be held back because of the job you hold today. Send coupon for full facts!

Prepare *NOW*

At Home or at our Chicago or Toronto Laboratories!

Use part of the income from the job you have today to prepare at home for a highly interesting and profitable career tomorrow! Or, come to Chicago or Toronto and train full time in well-equipped laboratories. It is probably easier than you think. Send coupon for FREE FACTS!

"One of North America's Foremost Electronics Training Centers"

Accredited Member of National Home Study Council

Sample Booklet FREE!

We'll give you a free copy of an interesting booklet, "Electronics and YOU." See for yourself how you may take advantage of the opportunities in this fast-growing field.

DeVRY TECHNICAL INSTITUTE
4141 Belmont Ave., Chicago 41, Ill., Dept. PS-2-O

Please give me your FREE booklet, "Electronics and YOU," and tell me how I may prepare to enter one or more branches of Electronics.

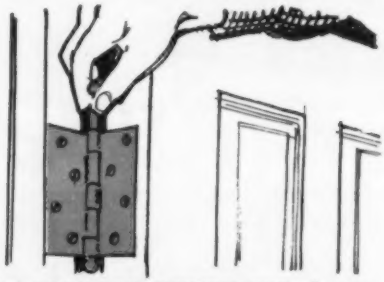
Name _____ Age ____
PLEASE PRINT
Street _____ Apt. ____
City _____ Zone ____ State ____

☐ Check here if subject to Military Training.

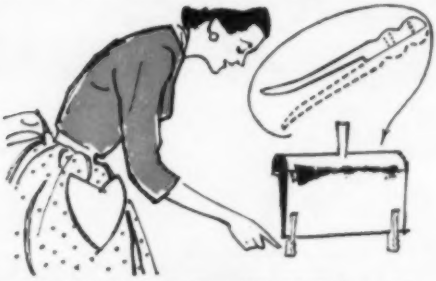
DeVry Tech's Canadian Training Center is located at 2033 426 Rosslawn Avenue, Toronto 12, Ontario

DeVRY TECHNICAL INSTITUTE
CHICAGO 41, ILLINOIS
Formerly DeFOREST'S TRAINING, INC.

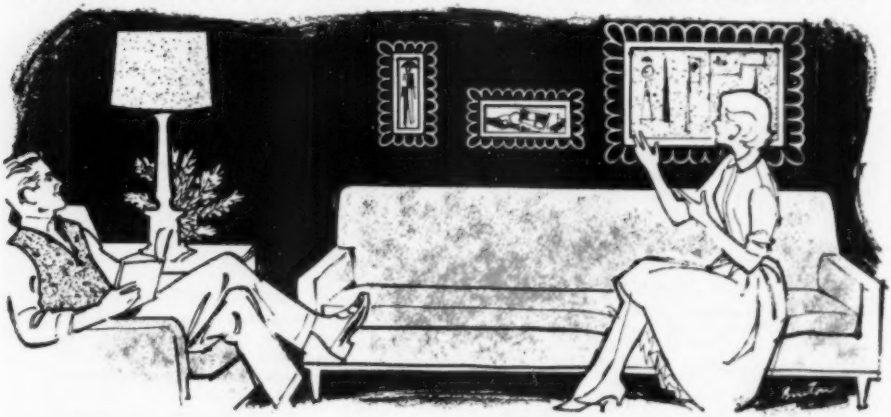
Keeping the Home Shipshape



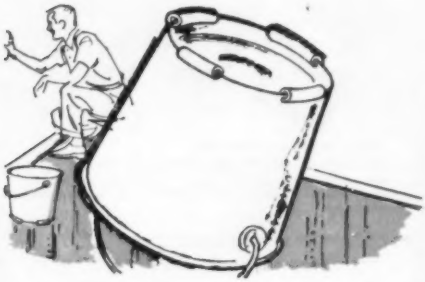
KEEP A DOOR FROM SWINGING SHUT when you don't want it to. Remove one of the hinge pins and pound it lightly to bend it a bit. When replaced, it will hold the door in any position.



YOU CAN MAKE A DUSTPAN RACK from two wooden clothespins sawed in two as shown. Drill the stepped pieces to take a screw and brad, and mount them on a closet wall or door.



TO MAKE A SMALL FRAME LOOK BIG, tack loops of stiff twine all around its edge at the rear. Then cover both the frame and twine with white paint, and fleck with gold accents.



PROTECT TILE FLOORS from being marred by the sharp bottom rim of a scrub pail. Four pieces of slit tubing attached to the protruding edge with rubber gasket cement will cushion it.

TO SEAL A PLASTIC BAG full of dry cereal or potato chips tightly, twist a pipe cleaner around its neck. The cleaner is easy to remove and can be re-used many times for resealing the bag.

Here's the BEST DEAL YET-
for the man who needs a
BETTER JOB-MORE MONEY

R. C. ANDERSON
President
CTI

If you're just "breaking even"... if you're "in the hole" every month ... if your wife wants to look for work—you need *more money, a better job!* You can *have* a good job with top pay and security in the old, established, but *fast-growing* Air Conditioning and Refrigeration industry. This field needs 20,000 newly-trained mechanics every year. It needs ambitious men to open service shops. *It needs you!* Don't say you're no mechanic! We know that. We also know *we can train you at home* to become a skilled mechanic. CTI has a real good deal for you. *Just fill in and mail coupon* and we'll rush full details.

NOW YOU CAN LEARN
AIR CONDITIONING
AND REFRIGERATION
by practicing at home with real equipment!

YOU GET "FIELD EXPERIENCE" AS YOU TRAIN

You train at home in spare time. CTI sends you 23 big kits of parts and tools. You assemble a commercial-type, heavy-duty, ¼ h.p. refrigeration high-side (illustrated at right.) Then you build an air conditioner, refrigerator, freezer or milk cooler. All equipment included with training! No extra cost.

You Get Kits Like These

At left is photo of tools included in just *one* kit. You get other tools, tubing, much equipment. Kits are sent on a planned schedule so that you learn in easy stages. You learn fast, too!

In another kit (right) you get motor, fan, pulley, service tools. Kits develop skill, let you get experience, eliminate years of low-pay apprenticeship.

Add to Your Income by Earning Cash as You Train

CTI training is practical, just like working on actual jobs. Like other students, you'll want to do repair work for profit soon after starting. Many students pay their tuition this way, add to their incomes, even get started in a business. Get the facts about this. *Mail coupon.*

COMMERCIAL TRADES INSTITUTE • 1400 Greenleaf Ave. • Chicago 26, Illinois

YOUR BIG CHANCE TO OPEN A SERVICE SHOP

Want to be independent—be your own boss? The air conditioning and refrigeration field is one of the best. It's big, uncrowded, packed with opportunity. Start small and grow big. Many students do service work on a monthly fee basis—do repairing for shops, food stores, meat markets, etc. Others answer home calls. In time, they build up a customer list, open a shop. You could, too!

FIRST GET THE FACTS—THEN DECIDE

MAIL COUPON TODAY FOR 2 FREE BOOKS

COMMERCIAL TRADES INSTITUTE
1400 GREENLEAF AVENUE DEPT. R-451
CHICAGO 26, ILLINOIS

Rush me your booklet, Success in Air Conditioning & Refrigeration, and Sample lesson. Both FREE.

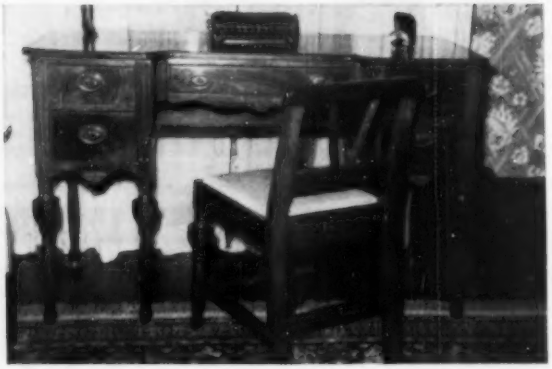
Name_____ Age____
Address_____
City_____ Zone____ State____

"TRAINING YOU CAN TRUST"

Prize Projects BY PS READERS

Mixed-Up Car. A two-hp. lawn-mower motor in the rear powers this little car that Alvis A. Lee of Prairie View, Tex., built for his daughters. Wheels and the driving mechanism came from an industrial mower, and the body is galvanized sheet iron over a wood frame. The only auto parts are a Crosley steering wheel and truck reflectors used as tail lamps. With the chassis, running gear and body constructed from backyard scrap, cost of the car was less than $75.

Door Stop. This miniature chair, styled after Duncan Phyfe, has a two-pound lead weight under the seat to give it heft. John G. Lownsbery of Richmond, Va., made it of solid Honduras mahogany assembled with dowel joints. The strings of the lyre at the back are $\frac{1}{16}''$ copper-coated welding rod, polished and lacquered. Blue velvet was used to upholster the seat of this ingenious and handy little job.



Desk and Chair. When farmer Arthur E. Ader of Rolfe, Iowa, sits down to his correspondence, he uses home-grown furniture. He built the desk and chair of solid walnut from trees cut on a neighbor's land. The job involved assembling and gluing 114 pieces of wood. The desk top is made up of three boards, doweled and glued. Ader also made his own shaper for edging the desk top.

Have *you* recently completed a workshop project of which you are particularly proud? Send a good photograph of your work, along with the negative and a brief description, to the Mechanics and Handicraft Editor, POPULAR SCIENCE, 353 Fourth Ave., New York 10, N. Y. We will pay $15 for each item that is accepted for publication.

GOOD JOBS . . . MORE MONEY SECURITY . . . ALL CAN BE YOURS

YOU are needed in the great modern Television-Electronics industry. Trained technicians are in growing demand, at excellent pay,- in sales and service, manufacturing, broadcasting, telecasting, communications, research, and many other important branches of the field. National Schools Master Shop-Method Training, with newly added lessons and equipment prepares you in your spare time right in your own home for these fascinating opportunities. OUR OUTSTANDING METHOD IS PROVED BY THE SUCCESS OF GRADUATES ALL OVER THE WORLD!

YOUR TRAINING IS ALL INCLUSIVE

We prepare you for a long list of job opportunities. Thousands of TV and Radio receivers are being sold every day—more than ever before. And, now, Color TV is here. Applications of Electronics in industry —AUTOMATION—are growing in tremendous strides. The whole field is alive — opening up new, important jobs rapidly. National Schools complete training program qualifies you in all phases of the industry.

YOU EARN WHILE YOU LEARN

Many students pay for their entire training — and more — with spare time earning. We'll show you how you can, too! Early in your course you receive material that shows you how to earn extra money servicing TV and Radio receivers, appliances, etc., for friends and acquaintances.

YOU GET EVERYTHING YOU NEED

Clear, profusely illustrated lessons, shop-tested manuals, modern circuit diagrams, practical job projects—all the valuable equipment shown above—many other materials and services—consultation privilege with our qualified staff, and Graduate Employment Service. EVERYTHING YOU NEED for outstanding success in Electronics.

INDUSTRY NEEDS YOU. NATIONAL SCHOOLS WILL TRAIN YOU. SEND FOR FACTS TODAY NO OBLIGATION.

YOU LEARN BY SHOP METHOD . . . you do servicing, circuit analysis, and do over 100 down-to-earth experiments. You build a Superhet Receiver and a modern TV Receiver, from the ground up, including a new, big screen picture tube. You also receive a professional, factory-made MULTI-TESTER. All of this standard equipment is yours to keep . . . at just one low tuition.

RESIDENT TRAINING AT LOS ANGELES

If you wish to take your training in our Resident School at Los Angeles, the world's TV capital, start NOW in our big, modern Shops, Labs and Radio-TV Studios. Here you work with latest Electronic equipment . . . professionally installed . . . finest, most complete facilities offered by any school. Expert, friendly instructors. Personal attention. Graduate Employment Service. Help in finding home near school . . . and part time job while you learn. Check box in coupon for full information.

Approved for GI Training

NATIONAL SCHOOLS
LOS ANGELES 37, CALIF.

FREE! VALUABLE BOOK & SAMPLE LESSON —Just Send Coupon!

NATIONAL SCHOOLS
TECHNICAL TRADE TRAINING SINCE 1905
LOS ANGELES 37 CALIFORNIA

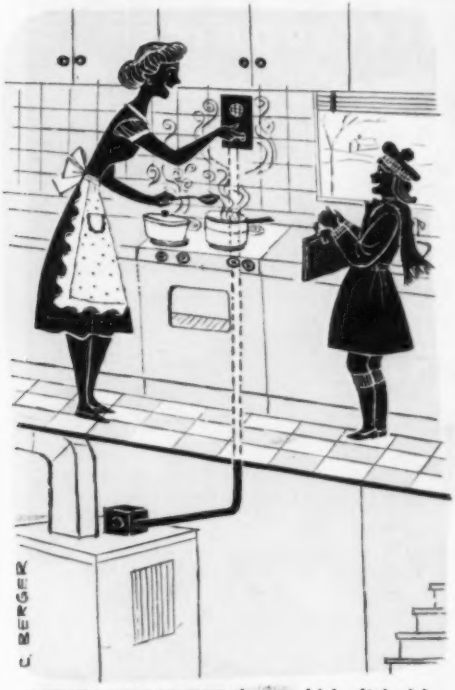
GET FAST SERVICE—MAIL NOW TO
NATIONAL SCHOOLS, DEPT. RC-28
4000 S. FIGUEROA ST.
LOS ANGELES 37, CALIF.

Rush free TV-Radio "Opportunity" Book and sample lesson. No salesman will call.

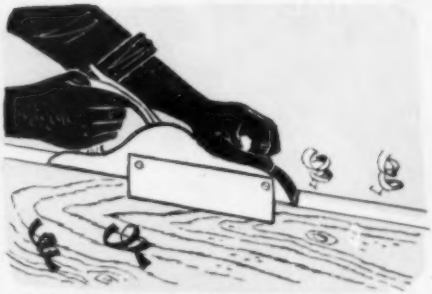
NAME _____ AGE _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

☐ Check if interested ONLY in Resident School training at Los Angeles.
VETERANS: Give date of Discharge _____

"I'd like to see them make..."



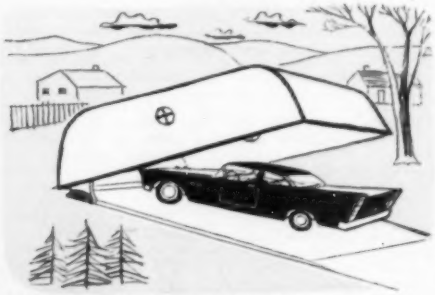
KITCHEN DEODORIZERS that could be linked by tubing to forced-air furnaces. They would quickly eliminate cooking odors in winter when windows are shut.—*Fred Purnell, Lombard, Ill.*



A JACK PLANE WITH AN EXTENSION at one side. By sliding the extension along the face of a board, you could keep the edge square while you planed it.—*Donald Snyder, Canton, Ohio.*

A VACUUM-BOTTLE ADAPTER to make it a baby's bottle for use at drive-in movies or on car trips. No need to heat the milk—just slip on the nipple.—*S. Abramczyk, Wyandotte, Mich.*

PULL-OUT DOME LIGHTS on cars. A long reel-wound cord would allow the lamp and housing to be removed for use as a trouble light outside the car.—*Robert Current, Fort Wayne, Ind.*



A ONE-PIECE PLASTIC GARAGE that would swing open or closed, like a clamshell, on a spring-and-hinge mechanism anchored in the concrete-slab base.—*Ralph Westervelt, Newark, N. J.*

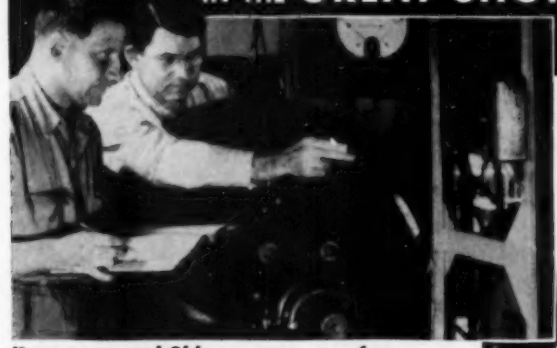
Everyone has his own pet idea of a gadget that he would like to see in general use. The five ideas illustrated above were suggested by POPULAR SCIENCE readers. What's *yours?* We will pay $5 for each one published. Please use Government postcards only. Write name and address clearly. Contributions cannot be acknowledged or returned.

LEARN

ELECTRICITY AND Industrial Electronics

ON REAL EQUIPMENT

IN THE GREAT SHOPS OF COYNE



LARGEST, OLDEST AND BEST EQUIPPED SCHOOL OF ITS KIND IN U.S.

This five story Chicago building is occupied entirely by Coyne. Five big floors of Classrooms and Massive Equipment. Thousands of successful men have trained at Coyne during past 58 years. There is no substitute for Coyne's wealth of experience.

Home of Coyne Electrical School

Young men and Older men prepare for

OPPORTUNITIES IN ELECTRICITY-ELECTRONICS

Whether 17 or up to 45 years of age, don't be satisfied with a "no future job." Train the Coyne way for a better job in *Electricity-Electronics—a field that offers a world of opportunities now and in the years ahead.* In industry—in the home—Electricity and Electronics are playing a vastly greater role than ever before. New developments and fabulous growth are creating increasing job opportunities.

YOU TRAIN IN CHICAGO

Learn the easier practical way in shops of Coyne in Chicago. Shop work plus technical training. No advanced education or previous experience needed. Lifetime Employment Service to Coyne Graduates. Frequent starting dates.

INDUSTRIAL ELECTRONICS – one of the more recent applications of Industrial Electronics to manufacturing processes – promises to create additional demands for trained Electrical-Electronics men such as we have never seen.

START NOW—PAY LATER

New liberalized credit terms and Finance Plans. Part-time employment service to students. Help in making housing arrangements.

VETERANS OR NON-VETERANS

Coyne training is offered to Veterans and Non-Veterans alike. We'll send Bulletin giving full information. *Send coupon for details.*

Training in Refrigeration and Electric Appliances can be included.

1. You are told the how and why of each job.

2. You're shown how to do it by trained instructors.

3. You do the jobs yourself on finest equipment.

B. W. COOKE JR., Pres. **COYNE** FOUNDED 1899

ELECTRICAL SCHOOL

A Technical Trade Institute Operated Not For Profit

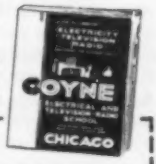
500 S. Paulina Street, Chicago, Dept. 28-4E

ELECTRICITY • RADIO • TELEVISION • REFRIGERATION • ELECTRONICS

Mail coupon for big free book!

48 Page Illustrated Book, *"Guide to Careers"* gives you all the facts, answers your questions about Electricity-Electronics and describes all training offered.

All information will come by return mail. No obligation and no salesman will call, so send coupon now!



Coyne Electrical School, Dept. 28-4E
500 S. Paulina St., Chicago 12, Ill.

Send BIG FREE BOOK about Electricity-Electronics and details of all training you offer.

Name----------

Address----------

City---------- *State*----------

(I understand no Salesman will call.)

IN TOWN TRAFFIC . . . *some spark plugs, designed for high speeds, become fouled and cause misfiring and loss of power when driven at low speeds.*

ON THE HIGHWAY . . . *some spark plugs, designed for low speeds, misfire causing power loss and invite destructive pre-ignition when driven at high speeds. Why gamble when . . .*

Auto-Lite Resistor Spark Plugs with POWER TIP "Fire Up" your engine* at all speeds!

If you drive at both town-traffic and highway speeds, here's why you should use Power Tip . . . the first spark plug ignition-engineered for today's engines and today's driving.

Power Tip protrudes farther into the combustion chamber for better ignition. Fuel burns more evenly and completely to give top performance and economy at *all speeds.*

At low speeds, the projecting Power Tip is in the thick of combustion where it gets hot quicker and stays hot to burn fouling deposits away *clean.* At higher speeds, the projecting tip is in the path of the incoming air-fuel mixture where it stays cool to *check* power-robbing pre-ignition.

Ask your garage or service station to install Auto-Lite . . . the *only* spark plugs with Power Tip . . . and start enjoying top performance and economy from your car at *all speeds.*

*Power Tip, with or without Resistor, is ignition-engineered for overhead-valve V-8 engines and for most overhead-valve 6-cylinder engines in all these cars—Buick, Cadillac, Chevrolet, Chrysler, De Soto, Dodge, Edsel, Ford, Hudson, Imperial, Lincoln, Mercury, Oldsmobile, Nash, Packard, Plymouth, Pontiac, Rambler, Studebaker.

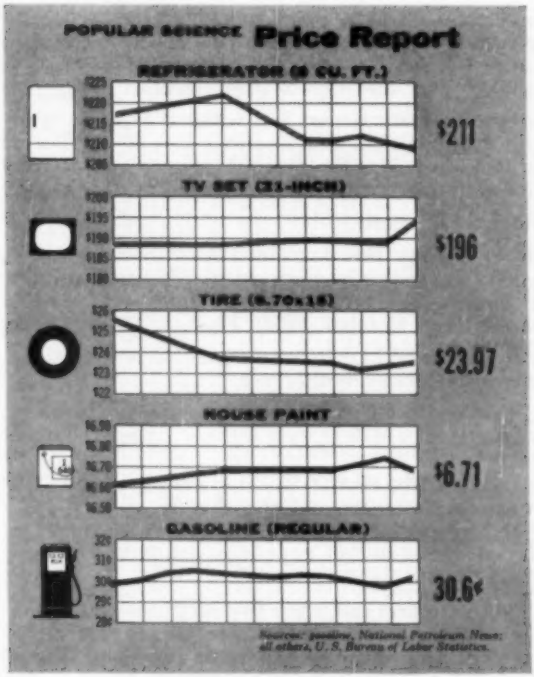
AUTO-LITE RESISTOR SPARK PLUGS WITH POWER TIP

Auto-Lite makes a complete line of spark plugs, including Standard, Resistor, Small-Engine, Transport, Aircraft, and Diesel-Starting.

You ought to know...

Solid price information—at last. Every month in this space PS will report on actual retail prices—the data, never before available, you need for smart shopping.

How much should you pay for a TV set . . . tires . . . paint . . . refrigerator . . . gasoline? List price doesn't mean much. Advertised price is often bait. To get the most for your money you want to know the going market price—what buyers are actually paying.



That's what the Popular Science Price Report will tell you. It's a PS exclusive. No other publication has ever done it.

The figures are average retail selling prices, collected every month in the five largest U.S. cities (New York, Chicago, Los Angeles, Detroit, Philadelphia) by a corps of professional shoppers. They're accurate. The gas prices are supplied by the staff of "National Petroleum News," a McGraw-Hill trade journal. The other four come from the Bureau of Labor Statistics, the Government agency that compiles hundreds of prices to compute the official Consumer Price Index (the figure used to adjust wages of some 3,000,000 workers). All PR prices include federal taxes, but *not* local sales taxes.

Which commodities? They're the ones you want to know about:

- Gas—regular grade.
- Paint—first-quality, exterior white (not trim), one-gallon lots.
- Tires—tube-type 6.70 x 15, four-ply, standard grade. Mounting charge is included, trade-in on old tire deducted.
- TV sets—21-inch standard table models using 15 to 18 tubes.
- Refrigerator—8.8 to 9.7 cubic feet; across-the-top freezer chest.

How to use the Price Report: Remember, these figures are aver-

You ought to know...

ages. Some stores charge more, others less. Consider the PR quotation as a starting point. You shouldn't have to pay much above it; you'll do still better by shrewd shopping.

Watch the trends. Each month we'll show a whole year's prices, month by month. If the curve is climbing but you're going to need to buy soon, buy now. If it leans downhill and the purchase is postponable, wait a while. We'll give you tips on this point, so that you can plan ahead (the Price Report quotes latest available figures, which necessarily are some weeks dated).

Watch the seasons. Tires, gas, paint run higher in spring and summer. Appliances jump right after new models come in (look what happened to TV sets last fall). The curve highlights seasonal quirks. We'll call your attention to them, forecast changes.

Know your area. The Price Report is a national average, representative of the whole U.S.A. But localities may differ. Detroit is high on gas (1¢), tires ($1), TV ($15). Chicago is high on paint (12¢), refrigerators ($16). We'll keep you posted on this, too.

Right now, watch these prices:

- Lumber could swing up. Housing starts have been down, so you can get good buys in two-by-fours, planks, boards, sheathing plywood (see Jan., p. 21). But residential building jumped 11 percent in October (over October, 1956). The bargains may fade.
- 1958 appliances all carried higher price tags. And now Hotpoint predicts another price hike early this year.
- Hard-surface floor and wall coverings are scheduled to go up as much as five percent.

How dangerous are loose auto nuts? Startling evidence shows that they—the mechanical fasteners, not the drivers in cars—are a major source of highway accidents. It comes from a survey of over 500 state inspection-station examiners conducted by New Jersey's Division of Motor Vehicles.

The division wanted to find out when so-called mechanical failures are really fastener failures. There are around 800 mated parts on an average auto. Most of the joints use some kind of lock washer to counteract strain and vibration.

Is a shaky fastener very dangerous? Nearly all the New Jersey examiners said "Yes!" After thumbing through their records, they came up with a total of 1,262 smash-ups caused by lost fasteners. No one part of a car was more dangerous than the others. Fastener failures in brakes, wheels, steering controls, drive shafts, axles and other parts all contribute to accidents. Danger spot: generally speaking, any place in a car where a lock washer is used to hold a nut and bolt together.

The American Association of Motor Vehicle Administrators has urged Detroit to give the problem serious consideration.

Title registered; contents copyrighted

Charles M. Ganey

This Practical Self-Study Course will give you

A COMPLETE MASTERY OF MATHEMATICS EASILY, QUICKLY

Learn Mathematics...get a BETTER JOB!

Now you, too, can learn mathematics and get the basic training for a better job...the kind of training that is quickly recognized today and gladly paid for.

Just look at the "help wanted" ads in any big-time newspaper—look at the hundreds of wonderful opportunities for men who know mathematics: superintendents and foremen, technicians and laboratory workers, designers, draftsmen, mathematicians and engineers. Look at the huge companies—page after page of them—that are advertising for help *every day in the year!* They all need trained men, men who know mathematics, to help them keep up with the ever-increasing demands in aviation, electronics, nuclear science, automation, jets and missiles.

Now you can learn mathematics—the foundation of all technical work—quickly, easily, inexpensively and right in your own home. A very simple and interesting course in book form has been prepared for you by an expert who has devoted a lifetime to teaching practical men the fundamentals of this important subject. Every minute you spend on this complete, practical course in mathematics will pay you big dividends.

MATHEMATICS For Self Study

By J. E. Thompson, B.S. in E.E., A.M., Dept. of Mathematics, Pratt Institute

A COMPLETE COURSE AND REFERENCE LIBRARY

You start right from the beginning with a review of arithmetic that gives the special short cuts and trick problems that save countless hours of time. Then, step by step, you go into higher mathematics and learn how simple it all can be when an expert explains it to you.

Get This Training in Only Ten Minutes a Day

You can gain all the benefits of a mathematical training in just a few months if you will devote only ten minutes each day to these easy, practical lessons.

An Expert Gives You His Simplified Methods

Prof. Thompson, the author of these books, is an expert at teaching *practical* Mathematics. He presents each problem in the clearest, simplest way. He gives you the kind of information you need for *success!*

Here are but a few of the hundreds of subjects simplified and explained in this complete self-study course in mathematics:

ARITHMETIC: Starting with a quick review of principles, this book gives you the special calculation methods used in business and industry that every practical man should know. Above all else it shows you how to attain speed and accuracy with fractions and decimals, ratio and proportion, etc. Fundamentals in all computations in engineering—in both plant and field—and the essential methods for rapid calculation are made clear and simple.

ALGEBRA: This volume makes algebra a live, interesting subject. The author starts with simple problems that can be solved by arithmetic and then shows you how to apply algebraic methods. Among other subjects, it teaches you all about logarithms—the method of computation that engineers use to save time. It also shows you how to solve problems which are involved in business and industrial work relating to machines, engines, ships, autos, planes, etc.

GEOMETRY: This book gives you the practical, common-sense method for solving all problems in both plane and solid geometry—problems ranging from the simplest distance problems to the geometry of spheres which have applications ranging all the way from the atom to the earth itself.

TRIGONOMETRY: Practically every problem in machine work, land surveying, mechanics, astronomy and navigation is solved by methods of trigonometry, and this interesting volume makes the methods of solving them clear and easy. These methods are explained simply with actual examples of calculations of height and distance as applied to meteorology, the position of a ship at sea, the construction of buildings, bridges and dams, the cutting of gears, etc.

CALCULUS: This branch of mathematics deals with rate problems and is essential in computation involving objects moving with varying rates of speed. It also enables you to find the most efficient design for any kind of mechanism, engine, or moving vehicle.

5 VOLUMES
1,543 Pages
Illustrated

D. VAN NOSTRAND COMPANY, INC., PUBLISHERS, PRINCETON, NEW JERSEY

Thousands of Jobs
Are Waiting for Trained Men

INDUSTRY is working at top capacity to meet the needs of our gigantic industrial program. Trained mechanics and technicians are in urgent demand, and in practically ALL OF THESE JOBS a knowledge of mathematics is required.

Remember, mathematics is the foundation of all technical work. Give yourself this basic preparation now by this quick, convenient, inexpensive method.

SEND NO MONEY

Send no money now, not a penny! The coupon at right will bring you the complete course in book form for 10 days free trial. Unless you are convinced that this course is exactly what you need and want you may return the books and owe nothing; or you may keep them by sending us the small down payment of $1.85, balance in four monthly payments of $2.00 each. Take advantage of this opportunity. Mail the coupon NOW!

MAIL THIS COUPON

D. Van Nostrand Company, Inc. PS-2-58
120 Alexander Street, Princeton, New Jersey

Send me MATHEMATICS FOR SELF STUDY in 5 volumes. Within 10 days I will either return the books or send you $1.85 as first payment and $2.00 per month for four months until the total price of $9.85, plus small delivery cost, is paid.

(If you send $9.85 with this coupon, we will pay the delivery cost. Same return privilege, refund guaranteed.)

Name_____

Address_____

City_____ Zone____ State_____

In Canada: Order from D. Van Nostrand Company Ltd., 25 Hollinger Road, Toronto, Canada

Check the Kind of Body YOU Want:

- ☐ Slimmer Waist, Hips
- ☐ Broader Chest, Shoulders
- ☐ More Weight, Solid
- ☐ More Powerful Arms
- ☐ More Powerful Legs
- ☐ More Energy, More Restful Sleep

. . . and I'll Show You How EASILY You Can HAVE It!

JUST tell me, in coupon below, the kind of body you want—and I'll give it to you SO FAST your friends will be amazed! I'll show you how you can become a NEW MAN in just 15 minutes a day—in your own home—or it won't cost you a penny!

You wouldn't believe it, but I myself used to be a 97-lb. weakling. Fellows called me "Skinny." Girls made fun of me. THEN I discovered my marvelous new muscle-building system—**"Dynamic Tension."** It turned me into such a specimen of MANHOOD that today I hold the title "THE WORLD'S MOST PERFECTLY DEVELOPED MAN."

"DYNAMIC TENSION"—that's my secret! When you look in the mirror and see a healthy, husky fellow smiling back at you—then you'll realize how fast **"Dynamic Tension"** GETS RESULTS. That's because it's the natural method you can practice in your own room—JUST 15 MINUTES A DAY—while your chest and shoulder muscles begin to swell . . . those arms and legs of yours bulge . . . and your whole body starts to feel "alive"—full of zip and go—INSIDE and OUT!

FREE Illustrated 32-Page Book Just Mail the Coupon

Send NOW for my famous book showing how **"Dynamic Tension"** can make you a new man. 32 pages, packed with photos, valuable advice, answers to vital questions. I'll send you a copy absolutely FREE if you rush coupon to me personally.

Charles Atlas, Dept. 12,
115 E. 23rd St., New York 10, N.Y.

CHARLES ATLAS, Dept. 12,
115 East 23rd St., New York 10, N. Y.

Dear Charles Atlas—Here's the Kind of Body I Want:
(Check as many as you like)

☐ Slimmer Waist, Hips ☐ More Powerful Arms
☐ Broader Chest, Shoulders ☐ More Powerful Legs
☐ More Weight, Solid ☐ Better Energy

Send me, absolutely FREE, a copy of your famous book showing how "Dynamic Tension" can make me a new man. 32 pages, crammed with photographs, answers to vital questions, and valuable advice. No obligation.

Name..... Age.....
(Please print or write plainly)

Address.....

City..... State.....

MEN! Make up to $1,000 IN A MONTH!

without "SELLING"

Sensational Demand for Low-Priced Fire Alarm PLUS Sure-Fire "No-Selling" Plan Offers Ambitious Men Huge Profit Opportunities

Even beginners cleaning up unbelievable profits with first practical, effective, low priced Fire Alarm. Needed in homes, factories, offices, stores, on farms, etc. Merlite Fire Alarm hangs on wall like a picture . . . no wiring, no installation. It's always on guard, "smells" fire before danger point. When temperature rises, Fire Alarm goes off automatically, howls loud warning that can be heard 1/5 mile, wakes up soundest sleeper, gives precious time to put out fire, call fire department, or escape. Sells for only $4.95, with profit up to $2.70 on each one.

Nearest Thing to Automation Selling

With our field-tested plan customers sell themselves. No cold canvassing; no hard selling. It's the nearest thing to "Automation Selling." Even a child can use plan successfully with powerful sales tools we give you (which you leave with prospects). This plan makes money for you even while you sleep! No room here to give you full details, but write for amazing facts.

Dramatic LIGHTED-MATCH DEMONSTRATION
Sensitive! Lighted match triggers Alarm in 3 seconds!

FREE SALES KIT

Send no money. Just rush your name and address for all the exciting money-making facts, complete Illustrated Sales Kit, everything you need to make money first day. Learn how selling only 20 Fire Alarms a day brings you $1,080.00 a month. No competition. Rush your name and address today.

MERLITE INDUSTRIES, INC. (Alarm Div.)
114 E. 32nd St., Dept. S-16F New York 16, N. Y.
***IN CANADA:* Mopo Co., Ltd., 371 Dowd St., Montreal 1, P. Q.**

ENGINEERING Home Study Courses

COURSES written by world authorities in all branches of engineering. Step-by-step instructions using methods proved successful by thousands of our graduates. One hour each day in your spare time will start you off to higher pay, security, prestige. Check the course you are interested in and we will send you a complete outline of the course with a booklet describing the Institute and our advanced methods of teaching. Send to: Canadian Institute of Science and Technology Ltd., 680 Century Bldg., 412, 5th St. N.W. Wash., D.C.

- Civil Eng.
- Surveying
- Architecture
- Forestry
- Mining
- Structural
- Mechanical Eng.
- Industrial Eng. & Management
- Refrigeration
- Heating
- Drafting
- Plastics
- Electrical Eng.
- Radio
- Electronics
- Television
- Aeronautical Eng.
- Aircraft Engineer
- Navigation
- General Education
- Chemical
- Mathematics
- Journalism
- Accounting

NAME.....

ADDRESS.....

CITY..... STATE.....

Course Interested In.....

Canadians: Send to Canadian Institute of Science & Technology Limited, 680 Garden Bldg., 263 Adelaide St. West, Toronto, Ontario.

INVENTORS

Learn how to protect your invention. The U. S. Patent Laws provide that any new and useful art, machine, article of manufacture, or composition of matter, or any new and useful improvement thereof, may be patented if the act of invention is involved. Therefore, every inventor with a valuable invention should take advantage of the Patent Laws and proceed for patent protection in order to safeguard his rights.

A patent gives the inventor the exclusive right to prevent others from making, using, or selling the invention claimed in the patent for a period of seventeen years.

The Patent Laws were enacted for the benefit of the inventor to give him protection for the features of his invention which are patentable. These features must be properly and concisely set forth and claimed in a formal application for patent, in order to comply with the requirements of the Patent Laws. For that reason, unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and are prepared to serve you in the handling of your patent matters.

A specially prepared booklet entitled "Patent Guide for the Inventor", containing detailed information with respect to patent protection and procedure, together with a "Record of Invention" form will be promptly forwarded to you without obligation upon request.

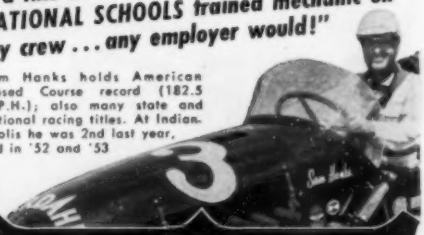
CLARENCE A. O'BRIEN & HARVEY JACOBSON

Registered Patent Attorneys

82-B DISTRICT NATIONAL BUILDING
WASHINGTON 5, D.C.

SAM HANKS, 1957 winner at Indianapolis says:

"I'd like a NATIONAL SCHOOLS trained mechanic on my crew . . . any employer would!"



Sam Hanks holds American Closed Course record (182.5 M.P.H.); also many state and national racing titles. At Indianapolis he was 2nd last year, 3rd in '52 and '53

MASTER ALL ENGINES

AT HOME IN YOUR SPARE TIME

NATIONAL SCHOOLS AUTO MECHANICS & DIESEL COURSE

INCLUDING FUEL INJECTION

YOU GET AND KEEP ALL THIS EQUIPMENT

Complete set of professional tools and All-Metal Tool Box. Same top-quality equipment used by expert mechanics everywhere. Use them, display them proudly.

"Motor Analyzing Set" contains Standard Engine Vacuum Fuel Pump Tester, Remote Starter Switch, Modern Timing Light, Standard Compression Tester. Plus compact carrying case & instructions.

Top - quality Socket Wrench with Fittings. Real professional tools you'll use during your lifetime career in repairing all types of engines, from foreign cars to big diesel jobs.

"I've worked alongside National Schools-trained mechanics," reports Sam Hanks. "They're tops, because they get all-around training, and they know how to repair fast and right the first time. No wonder National Schools graduates command top pay."

Earn as you learn men! We'll show you how. Streamlined lessons, diagrams, manuals, latest equipment, *practical* methods prepare you for hundreds of jobs in scores of industries. Free Placement Assistance.

Approved for GI Training

Resident Training at Los Angeles
If you wish to take your Auto-Diesel training in our famous Resident School at Los Angeles, check special box in coupon for full information.

NATIONAL SCHOOLS
Los Angeles 37, California

NATIONAL SCHOOLS
TECHNICAL TRADE TRAINING SINCE 1905
LOS ANGELES 37, CALIFORNIA

NATIONAL SCHOOLS, Dept DC-28
MAIL NOW TO
4000 S. FIGUEROA ST.
LOS ANGELES 37, CALIF.
Send for FREE Auto-Diesel Opportunity Book and Sample Lesson

NAME _____ AGE _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____
☐ Check if interested ONLY in Resident School Training at Los Angeles
VETERANS Give date of discharge _____

. . . TURN CONCRETE INTO GOLD!

R. L. T. of New York City reports: "MY GENERAL BLOCK MACHINE PAID FOR ITSELF IN FIRST 2 WEEKS!"
Hundreds now in use the world over! Write for FREE details today!

MAKE UP TO $75 A DAY IN YOUR OWN BUSINESS

If you want to have your own business — to start a business on your own — here's your big opportunity! New high speed; low cost General block machine produces up to 1,000 concrete blocks a day. Sell all you make to builders, supply houses, and others for homes, factories, buildings, garages. Cash in on the building boom! You can make profits of 100% to 150% — up to $75. a day! General block machine equipped with ½ h.p. electric motor — or can be supplied with gasoline engine — works anywhere, in little space, indoors or out. Operates from ordinary house light socket. Simple, foolproof 3 step operation — so easy a child can do it. Makes superior 3 core blocks any size from 4" to 12". Also makes chimney, sash, corner and other types. Blocks meet any building code anywhere in the country. Materials — sand, water, cement, available anywhere. Simple illustrated operating instructions and mixing formulas for cement and cinder blocks supplied with each machine. Write for FREE folder with full information.

EXTRA *Amazing illustrated book gives floor plans for 6 sensational concrete block bungalows. Tells how to lay blocks, lay out building lines, mix concrete, build steps, porch and concrete floors all at great savings. Written by experts. Can save many times the cost of the machine! Get it now! No strings attached. Send $1.*

HOW TO BUILD YOUR OWN CONCRETE BLOCK HOME Only $1 Prepaid

BOOK SENT FREE IF YOU BUY MACHINE.
$1 REFUNDED IF YOU BUY LATER.

GENERAL ENGINES CO.
DEPT. S-28 ROUTE 130, THOROFARE, N. J.

Rush coupon for scarce, beautiful stamps shown, and more — FREE! Asia, Africa, Europe — every corner of the world. The newest, hardest-to-find stamps issued in a year — *some not even cataloged yet.* All *genuine*, all *different*, mint and used, pictorials, bicolors from Antarctica, Siam, Israel, everywhere. Because this offer is unique, it may never be offered again. Due to scarcity, only one packet to each collector. So add this rare offer to your collection, *plus* helpful FREE "Stamp Collector's Guide" and other offers for your *free* inspection. RUSH name, 10c for postage, handling to GARCELON STAMP CO., Dept. 2 PSW, Calais, Maine.

Stamp Collector's Guide

GARCELON STAMP CO., Dept. 2 PSW
Calais, Maine. Rush FREE World-Wide Stamps, Collector's Guide, other offers. Enclosed 10c for postage, handling. (PLEASE PRINT)

.....
.....
.....

INVENTORS

If you believe that you have an invention, you should find out how to protect it. The first step is to have a search made of the prior pertinent U. S. patents. If a report on this search indicates that the invention appears patentable you can apply for a patent, and the specifications and claims should be prepared.

The firm of McMorrow, Berman & Davidson, with offices in Washington, D. C., is qualified to take the necessary steps for you. We can make a preliminary search on your invention, advise you whether we think it can be patented, and prepare your application for patent.

Unless you are fully familiar with the U. S. Patent Laws, we recommend that you engage the services of a Registered Patent Attorney to protect your interests. The patent laws are *your* laws. A patent gives you the right to prevent others from making, using or selling the invention claimed in your patent for a period of 17 years.

Use these patent laws for your protection. Investigate whether your invention can be patented. If you have what you believe to be an invention, we suggest that you have this firm make a search for you.

Send for a copy of our Patent Booklet entitled "How To Protect Your Invention," containing information about patent protection and patent procedure. Along with this we will also send you an "Invention Record" form, for your use in writing down and sketching details of your invention. We will mail them promptly. No obligation. They are yours for the asking.

McMORROW, BERMAN & DAVIDSON

Registered Patent Attorneys

PATENTS · COPYRIGHTS · PATENTS

142-H VICTOR BUILDING, WASHINGTON 1, D. C.

EARN WHILE YOU LEARN RADIO-TELEVISION my new, faster way!

Frank L. Sprayberry Educational Director

Let me prove to you . . . without cost or obligation . . . that I can prepare you to be a Radio-Television Serviceman in 10 Months or Less

Let the true facts speak for themselves! That's why I want you to have my big new catalog and an actual sample lesson of Sprayberry Training—both FREE! READ—then make up your own mind! Train at home in spare hours for the best jobs and the biggest pay in Radio-Television. Easy payment terms suited to your budget. I will help you earn extra money doing radio service jobs while you learn!

Get Practical Experience with 25 Kits of Radio-TV Parts

Practical experience counts most. In addition to modern lessons, you train with actual parts and equipment. Build the famous Sprayberry Training Television Set, Multi-Range Tester, 2-Band Radio, other Test Equipment—all yours to keep. Get latest training on Color TV, Transistors, Hi-Fi and UHF Conversions . . . included to make your training more valuable.

You owe it to yourself to get all the facts . . . Mail coupon for catalog and sample lesson — FREE

TWO BIG FREE BOOKS

See for yourself . . . in actual pictures and descriptions . . . why Sprayberry Radio-Television Training offers *more*. Backed by almost 25 years of training experience. Three training plans to suit your exact needs. Rush coupon today for big new catalog and sample lesson. No obligation; *no salesman will call.*

SPRAYBERRY ACADEMY OF RADIO-TV
1512 Jarvis Ave., Dept. 55-D, Chicago 26, Ill.

Mail Coupon Today!

SPRAYBERRY ACADEMY OF RADIO-TELEVISION
1512 Jarvis Ave., Dept. 55-D Chicago 26, Ill.

Please rush catalog on your ALL-NEW Radio-Television Training Plans. I understand this does not obligate me and that *no salesman will call.* Include Sample Lesson FREE.

Name_____ Age____

Address_____

City_____ Zone____ State____

Our Best Value of the Year!

2½ AMP. RUGGED POWER

¼" THOR SPEEDRILL

Geared Chuck & Key—AC-DC 2400 RPM BRAND NEW!

$14.95 plus 50c pp. & hdlg. ppd.

If your work calls for a "rugged" drill with POWER to SPARE, insist on a 2½ Amp. job. . . . and make sure it's THOR! No finer drill made! Solid steel, heat-treated helical gears; thrust taken on hardened steel ball and plate; gears permanently packed and sealed in LIFETIME grease! Switch, trigger and lock assembly simplifies locking and release trigger. You'll be wise to buy 2 at this price.

Surgical Steel Hand Ground

Set of 12

$2.00 CARVING KNIVES

ppd. The sharpest, keenest ground, surgical steel blades we have ever seen—sharp enough to split a human hair in two! 12 different shapes and edges can do every job of wood carving, model making, linoleum cutting, sculpting and whittling imaginable. Each blade has a 4½" long hardwood handle for easy gripping . . . heavy duty blade is firmly attached by means of a brass ferrule to ensure long, continued rugged use. Each surgical steel blade precision hand ground to easily and quickly notch and cut any shape you wish. A sensational all-purpose set, well worth $5.95 . . .

OUR PRICE $2.00 ppd.

Prices SLASHED 50% on Polyethylene PLASTIC ROLLS!

Use As STORM WINDOWS—Dust, Moisture-Proof Protection!

TACK IT, STAPLE IT, HEAT SEAL IT, TAPE IT

Protects from dust, dirt, moisture rust, moths, heat, cold, etc. Transparent. Stains wipe off! Lightweight, strong, inexpensive!

Waterproof, Resistant to Dust, Air, Grease—Unaffected by Heat, Cold

For HOME—Cover auto seats, furniture, mattresses, lamps, rugs, appliances, luggage, silver to prevent tarnish, air conditioners. Use as shower curtains, storm windows. Keep paint off furniture, floors, etc. Wrap food, mothproof wrap clothes.

For OUTDOORS—Cover boats, sports and fishing equipment, tennis courts, cars. Make children's play tents.

For GARDENS—Protect outdoor furniture and equipment, shrubs, plants, newly seeded lawns. Build greenhouses. Cover lawn mowers.

For INDUSTRY—Cover equipment and machinery. Fumigation, oxygen tents. Painter's drop cloth. Floor covers for car trunks, trucks. Chases moisture vapor from crawl spaces, etc. Curing concrete. Keep rain away from outdoor work areas.

36"x100 ft.	.004 gauge	$6.95
54"x100 ft.	.004 gauge	10.95
84"x100 ft.	.004 gauge	15.95
120"x100 ft.	.004 gauge	22.95

EXTRA SPECIAL

50"x200 ft.	.002 gauge	$9.95
100"x200 ft.	.002 gauge	19.95
120"x100 ft.	.006 gauge	29.95

Add 50c ea. item for pp. & hdlg.

Send Check or M.O. C.O.D. fee extra MONEY BACK GUARANTEE

SCOTT-MITCHELL HOUSE, INC. Dept. E-2, 611 Broadway New York 12, N. Y.

You Can Be A CLAIM INVESTIGATOR

We'll Train YOU for a LIFE OF EXCITEMENT • BIG PAY • SECURITY in the fast growing billion-dollar Claim Adjustment Field.

INVESTIGATE

AUTO ACCIDENTS

WINDSTORM LOSSES

BURGLARIES

EVERY COMMUNITY NEEDS ADJUSTERS

Every second of every day accidents and losses happen—and trained claim adjusters are needed to investigate and to distribute billions of dollars.

Yes, thousands of insurance companies, airlines, railroad companies, steamship lines, and Government Offices must continually use Claim Investigators and Adjusters. Trained Claim Agents are *always* in demand. Many earn over $750 a month.

Here is your opportunity. At home in spare time you can learn this fascinating work—easily, quickly.

In taking our Adjuster Training Course you are given the necessary knowledge either to enter your own business or to work with one of the large companies.

Mail This Coupon NOW for FREE Book

UNIVERSAL SCHOOLS, Dept. PS-2
University Park, Box 8202, Dallas 5, Texas

Please rush me your free book on Claim Investigation. This does not obligate me and no salesman will call.

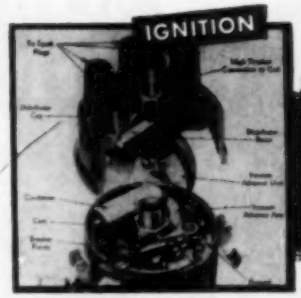
Name_____ Age____

Address_____

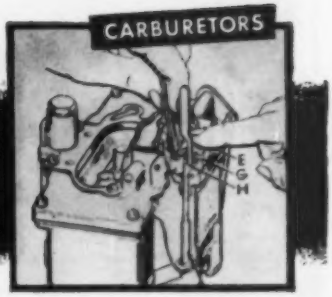
City_____ Zone____ State____

COVERS ALL THESE MAKES — ALL MODELS, 1949 THRU 1958

Buick	De Soto	Jeep	Plymouth
Cadillac	Dodge	Lincoln	Pontiac
Chevrolet	Edsel	Mercury	Rambler
Chrysler	Ford	Nash	Studebaker
Clipper	Hudson	Oldsmobile	Thunderbird
Continental	Imperial	Packard	Willys



Clear photos, cutaway drawings and diagrams, plus know-how directions make every part of any ignition system crystal-clear.



No more guesswork. You get illustrated, step-by-step procedures for all types of carburetors.

Let Factory Experts Show You HOW TO FIX ANY PART OF ANY CAR

OVER 2½ MILLION COPIES SOLD! USED BY U. S. ARMED FORCES

This Famous "Auto Repair Bible" Turns Beginner Mechanics Into Experts—Saves Experts Time, Trouble, Money

SUPPOSE crews of trained factory experts were ready to guide your hands as you start to fix *any* part of *any* car. If they told you EXACTLY WHAT TO DO, couldn't you "wrap up" any repair job—quickly, easily, right? That's exactly the kind of expert guidance you get in MOTOR'S new AUTO REPAIR MANUAL!

YOU CAN'T GO WRONG!

With clear illustrations and step-by-step instructions, these experts show you how to "breeze through" any job on any car listed—1949 thru 1958. Even if you're a beginner, this famous Manual can show you how to fix cars the way the EXPERTS do. Tells you WHERE to start, what TOOLS to use, guides you every STEP of the way!

You get practical how-to-do-it procedures—worked out by AUTOMOTIVE ENGINEERS—from 176 official Shop Manuals, hundreds of factory bulletins, boiled down in simple, easy-to-follow language. Over ONE THOUSAND giant pages, 2,900 "This-is-How" pictures. 291 Quick-Check Charts — 23,436 essential repair specifications. Over 225,000 service and repair facts. Instructions and pictures are so clear you can't go wrong!

3 BOOKS IN 1

You actually get three complete "show-how" books in one giant handy, indexed volume:

1. **Complete TROUBLE-SHOOTER SECTION** spots more than 2,300 car troubles, helps you find the "bugs" fast.

2. **HOW TO SERVICE, REPAIR ALL CAR PARTS**—Transmissions, Air Suspension Systems, Rear Ends, Generators and Regulators, Fuel Pumps, Ignition Systems, Overdrives, Automatic Transmissions, Brakes, Rings, Water Pumps, Distributors, Dash Gauges, Power Steering, Power Brakes, etc., etc.

3. **STEP-BY-STEP INSTRUCTIONS AND PICTURES** on each specific car make and model—covers over 600 car models—1949 thru 1958.

PLUS Factory Specifications and Adjustment Tables, Tune-up Charts, Overhauling and Replacement facts—and MUCH MORE! Used by Armed Forces, hundreds of thousands of auto service men.

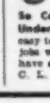
TRY BOOK FREE 7 DAYS

Send no money! Just mail coupon (paste it to a postal card if you prefer). Use Manual for a week, *free*. Unless you agree that it is the greatest time and money-saver you've ever seen, return it in 7 days—and you won't owe a cent! Mail coupon today! Address: **MOTOR Book Dept., Desk 2B, 250 West 55th St., New York 19, N. Y.** (SCHOOLS, BOOK-STORES: Write for discounts.)

FREE 7-DAY TRIAL
Return and Pay Nothing If Not Delighted

Same FREE 7-Day Offer on MOTOR'S Brand-New TRUCK REPAIR MANUAL

Covers EVERY job on EVERY gasoline-powered truck made since 1949—PLUS GM and Cummins Diesels. Over 2,000 illustrations; over 300,000 facts. Check proper box in coupon for FREE 7-DAY TRIAL.



Amazed Self and Friends—"I amazed myself and my friends, too. New do jobs that stumped me before."—Michael Balicky, Newark, N. J.

So Complete and Easy to Understand — "So complete, easy to understand—have done jobs with Manual I would not have attempted without it."—C. L. Vanerstrom, Mich.

MAIL COUPON NOW FOR 7-DAY FREE TRIAL
(Attach to postcard if more convenient)

MOTOR BOOK DEPT.
Desk 2B. 250 W. 55th St., New York 19, N. Y.

Rush to me at once (check box opposite book you want):

☐ **MOTOR'S New AUTO REPAIR MANUAL.** If O.K., I will remit $3 in 7 days, $2 monthly for 3 months and a final payment of $1.95 (plus 25c delivery charges) one month after that. Otherwise I will return the book postpaid in 7 days. *(Foreign price, remit $10 cash with order.)*

☐ **MOTOR'S New TRUCK REPAIR MANUAL.** If O.K., I will remit $3 in 7 days, and $2 monthly for 3 months, plus 25c delivery charges with final payment. Otherwise I will return book postpaid in 7 days. *(Foreign price, remit $11 cash with order.)*

Print Name.....Age.....

Address.....

City.....State.....

☐ Check box and save 25c shipping charge by enclosing WITH coupon in envelope entire payment of $7.95 for Auto Repair Manual (or $8 for Truck Repair Manual). Same 7-day return-refund privilege applies.

2 YEARS OF STUDY can give you these ADVANTAGES

- Associate in Applied Science degree
- Preparation for a career as an engineering technician in

ELECTRONICS
ELECTRICAL POWER
METALLURGY
COMPUTERS
AIR CONDITIONING

- or you can continue without loss of credit to a 4-year Bachelor of Science degree in Mechanical or Electrical Engineering

at MSOE in Milwaukee

THE ENGINEERING TECHNICIAN

FREE folder answers your questions about the Engineering Technician, who he is, what he does, and how to become one.

SEND TODAY

MILWAUKEE SCHOOL OF ENGINEERING
1025 N. Milwaukee St., Dept. PS-258 Milwaukee, Wisconsin
Please send free folder
☐ "The Engineering Technician;"
☐ Booklet "Your Career in Engineering."
(please print)

I'm interested in _____
(name of course)

Name _____ Age _____

Address _____

City _____ Zone ____ State _____

Eligible for vets. educational benefits ☐ yes ☐ no.

Discharge date _____

MS-85

BUY BELOW WHOLESALE

Start Your Own HOME-IMPORT Business

Make big profits on thousands of exotic imports. No experience or investment in products needed. Famous world trader guides men and women—shows how to pocket profits in advance, **how to start full or spare time home mail order business.**

Open cash orders, take out the money, deduct your profits, then have the imports shipped direct from abroad. NO STOCKS TO CARRY on new plan, no face to face selling. Or handle volume orders for wholesalers, gift or department stores, etc. Export opportunities also.

FREE SAMPLES—CONTACTS ABROAD

Following our plan you receive free, 8 imports—and membership in International Traders which provides you with monthly bulletins revealing foreign products with names and addresses of overseas suppliers.

HUGE UNCROWDED OPPORTUNITY

Each year more imports are offered in U. S. and snapped up by mail order and store buyers alike. And the word "imported" is like magic to the millions who want new, rare, romantic and unusual gifts at big savings. And there seems to be no end to this demand. Others using our plan are now importing at low foreign costs products that sell here at handsome profits. Why not you?

GET FULL DETAILS and list of 157 imports showing amazing low foreign prices—***ALL FREE!*** There's no obligation whatever. No salesman will call on you. Air mail reaches us over night. Write today.

EXAMPLES OF LOW PRICES ABROAD

THE MELLINGER CO.
1717 Westwood Blvd., Dept. P242
LOS ANGELES 24, CALIF.

ANOTHER OF INDUSTRY'S

MOST-WANTED MEN

Chemical Lab. Technician
—wanted for vital, high-pay jobs in a variety of fields. I.C.S. can help you qualify—quickly and at low cost.

SEE SPECIAL OPPORTUNITY CHECK-LIST—PAGE 51

I'll Send You This Handsome SAMPLE CASE-FREE

and Show You How to Make Up to $30.00 in a Day

Mail coupon for this Free Tailoring Sample Case packed with 100 beautiful, big-value suit and overcoat fabrics. Take orders from friends, fellow-workers, others, for fine quality, made-to-measure clothes. Pocket big cash profits in advance. Because wearing our suits and overcoats brings more orders, we make it easy for you to get your own clothes without 1c cost. No experience is needed. SATISFACTION GUARANTEED. SEND NO MONEY. Just fill out and mail coupon—today!

PIONEER TAILORING COMPANY, Dept. U-1120
CONGRESS & THROOP STREETS - CHICAGO 7, ILLINOIS

PIONEER TAILORING CO., Dept. U-1120
Congress & Throop Sts., Chicago 7, Ill.

Dear Sir: I WANT A MADE-TO-MEASURE SUIT TO WEAR AND SHOW, without paying 1c for it. Rush details and Sample Kit of actual fabrics, ABSOLUTELY FREE.

NAME _____ AGE _____

ADDRESS _____

CITY _____ STATE _____

If You Had Mailed This Coupon LAST MONTH— You'd Be Playing Real Music TODAY!

U. S. SCHOOL OF MUSIC
Studio 152 Port Washington, N. Y.
I am interested in learning to play, particularly the instrument checked below. Please send me your free illustrated booklet, "How to Learn Music at Home." NO SALESMAN IS TO CALL UPON ME. NO SALES.

- ☐ Piano
- ☐ Guitar
- ☐ Steel Guitar
- ☐ Violin
- ☐ Piano Accordion
- ☐ Saxophone
- ☐ Trumpet, Cornet
- ☐ Pipe, Hammond, Reed Organ
- ☐ Tenor Banjo
- ☐ Ukulele
- ☐ Clarinet
- ☐ Trombone
- ☐ Flute
- ☐ Piccolo
- ☐ Modern Elementary Harmony
- ☐ Mandolin
- ☐ Practical Finger Control

Do you have the instrument? .....

Mr. / Mrs. / Miss .....
(Please Print Carefully)
Address .....
City ..... State .....
(Insert Zone Number, If Any)
☐ If under 18, check here for Booklet A.

BUT IT'S NOT TOO LATE TO JOIN THE THOUSANDS WHO HAVE TAUGHT THEMSELVES THIS QUICK, EASY, INEXPENSIVE WAY!

YES, IT'S TRUE! If you had answered our ad a few weeks ago, **you'd be playing real music RIGHT NOW!** And you'd be well on your way toward mastering your favorite musical instrument—**even if you'd never known a single note before!**

Impossible? Not at all! Over 900,000 students have already taken up this famous home-study method—and even children "catch on" rapidly. Now ANYONE can learn to play the piano, violin, accordion, guitar, or any other instrument. And the cost is only a few cents per lesson, including valuable sheet music!

NO "SPECIAL TALENT" REQUIRED

No previous training needed, no "special talent" required. Right from the start, this amazing music discovery will have you playing **real melodies** instead of practicing boring scales and exercises. Clear, simple directions and show-how pictures tell you exactly what to do, so you can't go wrong. Soon you'll amaze your friends by playing your favorite songs easily, confidently, **by note!** No inconvenient lesson periods, no expensive hourly tuition. You learn in spare time of your own choosing.

STOP MISSING THESE JOYS

Why not let the U. S. School of Music method bring the many joys of music into your life? Good times! More confidence. New friends. Gay parties. Extra money from playing or teaching. Possibly even a brilliant musical career. Best of all, the deep **satisfaction** of being able to create your own music.

See for yourself why our method has been so successful for 60 years! Mail coupon AT TOP OF PAGE for valuable 36-page FREE BOOK. No obligation! No salesman will call. It can mean so **much** to you for the rest of your life—if you mail coupon today. U. S. School of Music, Studio 152, Port Washington, N. Y. **(Special Reduced Prices on Instruments to Our Students.)**

Choose Your Favorite Instrument

Now it's easy to learn—by note—Piano, Guitar, Accordion, Violin, Steel Guitar, Mandolin, Trumpet, Cornet, Saxophone, Tenor Banjo, Organ, Ukulele, Clarinet, Trombone, Flute or Piccolo—check your choice in coupon at top of page.

MAIL COUPON NOW—PLAY NEXT MONTH

THOUSANDS NOW PLAY WHO NEVER THOUGHT THEY COULD!

12-Year-Old Surprises Her Friends

"I am twelve years old. Thanks to your Course, I was able to play for our church. All my friends were certainly surprised when they discovered I could play!"—**Patsy Jeffroy, Sweetwater, Texas**

How Famous Orchestra Leader Got His Start

"I got my start in music with a U. S. School Course. How easy it is to learn to read notes and play an instrument this 'teach yourself' way!"—**Lawrence Welk, famous orchestra leader. (Picture at left)**

Excels Friend Who Has Teacher

"I never took lessons before I started to take them from you—and still I can play better than my friends who began at the same time I did with a private teacher."—**Joan Lueck, Big Stone, South Dakota**

"How Rapidly I am Progressing"

"I just want to tell you how much I enjoy your lessons for the Tenor Banjo, and how rapidly I am progressing. Lessons are so simple, anyone can understand them."—**Andrew Schneider, Hanna, Wyoming. (Picture at left)**

"Opened Door to Popularity"

"I was able to play many pieces in a short time. Course opened door to popularity, wider circle of friends."—**Peter H. Kozyra, P.O Brokenhead, Manitoba. (Picture at left)**

Now Invited Out Lots

"It's been fun. Hasn't cost anywhere near as much as private teacher. Now invited to affairs, dances ..."—**Howard Hopkins, E. Syracuse, N. Y. (Picture at left)**

Now Plays at Church

"I had tried several times to start music lessons. I had been detained on a teacher before. Now I play at church, etc."—**Mrs. P. J. Tatman, Sycamore, Illinois.**

Inventors

If you consider your invention valuable, take these necessary preliminary steps promptly to protect it by applying for a United States patent.

Sketch and describe your invention. (For convenience in starting action on your invention, use "Evidence of Invention" form offered below.)

Sign, date and have this invention disclosure witnessed by two people capable of understanding your invention.

Have us make a preliminary search among U. S. patents already granted for similar types of invention.

We then prepare a report for you on the probable patentability of your invention and recommend your further course of action.

This firm is registered to practice before the U. S. Patent Office. We are available to assist you in the preparation and prosecution of your application for patent.

We shall be glad to send you promptly and without obligation, an instructive booklet—"Patent Protection for Inventors"—and our convenient "Evidence of Invention" form.

VICTOR J. EVANS & CO. *Merlin M. Evans*
REGISTERED PATENT ATTORNEY
440-B MERLIN BUILDING, WASHINGTON 6, D. C.

INVENTORS

PROTECT YOUR INVENTION BY A U. S. PATENT. SEND FOR FREE "INVENTION RECORD" FORM AND "PATENT INFORMATION EVERY INVENTOR SHOULD HAVE".

CARL MILLER
REGISTERED PATENT ATTORNEY
WOOLWORTH BLDG., 36th FLOOR, 28C
NEW YORK CITY

INVENTORS

U. S. Patents protect your inventions. Our free book of "Instructions on Patent Procedure for Inventors," also "Certificate of Invention" form sent without obligation.

C. A. SNOW & CO.
REGISTERED PATENT ATTORNEYS
426 SNOW BUILDING WASHINGTON 1, D. C.

INVENTORS

Whether an invention is patentable can be substantially determined by a search of the U. S. Patent records. Without obligation, write for information explaining the steps you should take to secure a patent.

JOHN N. RANDOLPH
Registered Patent Attorney
205 Columbian Building Washington 1, D. C.

INVENTORS

Send for PATENT INFORMATION Book and INVENTOR'S RECORD without obligation

GUSTAVE MILLER
28PS WARNER BUILDING
WASHINGTON 4, D.C.

REGISTERED PATENT ATTORNEY
ASSOCIATE EXAMINER U.S. PAT. OFF. 1922-1929
Patent Attorney & Advisor U. S. NAVY DEPT. 1930-1947
PATENT LAWYER

INVENTIONS WANTED

If you want to market, or sell, your invention for cash or royalties, Write for our Free Booklet. Send no drawings. We also welcome hearing from firms, or private capital, wishing to review inventions in any field. We will be glad to send notice of our clients' inventions.

GLOBAL MARKETING SERVICE
2420 77th Ave. Dept. SD Oakland 5, Calif.

High School at Home

MANY FINISH IN 2 YEARS

No classes. No time wasted going to and from school. Progress as fast as your time and abilities permit. Standard H. S. texts supplied. Thousands enroll each year in this 61-year-old school. Send for FREE descriptive booklet.

AMERICAN SCHOOL, Dept. H246
Drexel at 58th St., Chicago 37, Ill.
Without obligation, please send FREE descriptive booklet.

Name.....

Address.....

NEW WAY TO
TRAIN AT HOME
FOR A
BIG PAY CAREER
AS A TOP NOTCH
AUTO MECHANIC
PROVE IT ABSOLUTELY FREE!

SEND NO MONEY!

Mail coupon below to examine these Complete Library and Home Course volumes on Auto Mechanics 10 days FREE!

YOUR OWN CAR IS YOUR TRAINING LAB!

The most natural place to learn auto mechanics is in your own garage! With this 6-volume Library by your side, you work on neighbors' cars, too . . . make cash money in spare time!

2,745 PAGES — Nearly 2,000 Illustrations — Dozens of Charts. The Complete Information You Need To Be A Qualified Auto Mechanic!

Start at once training this HOME SHOP way for the highest mechanics' wages in history! No matter what you are doing now, you can *learn at home* quickly, surely—qualify for steady work, security and rapid advancement. You can make CASH money while training—and plan to open your own shop, be your own boss! Right now 30,000 mechanics are desperately needed. Get in on this booming field and prepare for a CAREER as a *specialist!*

PROVE This Amazing Training ON THE JOB!

That's right! TEST the giant 6-volume McGraw-Hill *Complete Auto Repair and Servicing Library* which includes the *Home Course Outline*. We want to send you this made-to-auto-industry-specifications training so that you can see this Set in front of you—sample it—use it on a job—understand why ONLY a master Set of many volumes can give you the complete facts for repairing and servicing any part in any car!

No Longer Any GUESSWORK!

We want you to prove how the step-by-step instructions and "every-angle" photographs, drawings and diagrams make the most complex repair easy—quick—*right the first time!* See how you can tune engines, overhaul carburetors, service transmissions in all cars from 1926 right up to the present day with full confidence. See how each volume is like a specialist—ready to train and guide you to meet each car need—including servicing all of the modern innovations. Make the secrets of experts your own; see how you will be in control of every situation, as if you had an engineer standing by your side to guide your entire training!

The MASTER LIBRARY Of Automobile Mechanics

The McGraw-Hill Library is the work of William H. Crouse, noted author of practical auto repair books and at one time a Director of Field Service Education for a division of General Motors. He takes nothing for granted, leaves no point uncovered. He has planned the Library for the man who wants to *master* auto mechanics—not just "tinker" at it . . . who wants to know the *why* as well as *how*, BASIC reasons for all work are explained in clear terms. Your knowledge is checked every few pages with exciting Self-Quizzes. You learn when to repair, how to service and the why of every job you'll ever do. Everything has been tested with thousands of beginners and engineers.

STEP-BY-STEP INSTRUCTIONS TELL AND SHOW YOU HOW TO
• OVERHAUL any engine • SERVICE, MAINTAIN any unit • CHECK and DIAGNOSE any engine trouble • TRACE troubles in lines • CORRECT excess engine wear conditions • INSTALL any new part or unit • ADJUST all moving parts, etc.
THOUSANDS OF FACTS!

ADDITIONAL FREE - HOME COURSE OUTLINE

A proven plan for making auto mechanics a lifetime CAREER! Tells how to get started and how to get ahead. An absolute must for the ambitious man who wants more than just a "job." Prepared by Wm. H. Crouse. OUTLINE is yours FREE!

MAIL THE COUPON—WITHOUT MONEY—TODAY

Yes, we want you to use this giant 6-volume Library for 10 days and then make up your mind! Mail the coupon; when books arrive use them to guide you to the most complex repair you can think of. Make them prove what we say. Then—in 10 days either return them and that will end the matter, or remit $4.75 and $5.00 each month thereafter until $29.75 is paid . . . an actual saving of $9.30 on the regular list price of $39.05. Don't miss out on this opportunity. Mail the coupon now!

FREE EXAMINATION COUPON SAVES YOU $9.30

McGraw-Hill Book Co., Dept. PS-2
327 West 41st St., New York 36, N. Y.

☐ Send me for 10-day FREE trial the McGraw-Hill 6-vol. Complete Auto Repair and Servicing Library including Home Course Outline "How To Get Ahead In the Automotive Business." In 10 days I will remit $4.75 and $5.00 a month until $29.75 is paid—a $9.30 saving on list price of $39.05. Otherwise, I will return books postpaid.

Check below to examine free for 10 days *individual* Crouse books from the Library

☐ Engines—$7.00 ☐ Fuel, Lub. & Cooling Systems—$8.35
☐ Transmissions—$8.35 ☐ Chassis & Body—$8.35
☐ Automotive Electrical Equipment—$7.00

For any single book I keep I will send $3.00 plus delivery cost in 10 days. Balance of regular price one month later.

Name ..... (Please Print)
Address .....
City ..... Zone .... State .....

For price and terms outside the U. S., write McGraw-Hill Int'l., New York, N. Y. PS-2

TESTED AND PROVED BY THOUSANDS OF TRAINEES

YOU CAN SUCCEED IN BUSINESS THROUGH SPARE TIME HOME TRAINING

A better position—a higher salary—can be yours IF you can do the work. Business is always willing to pay the man who knows—and pay him well.

You don't have to be satisfied with a mediocre job at low pay when in your spare time at home you can quickly, and without interference with your present work, prepare for a brighter and happier future.

For nearly 50 years ambitious men and women have turned to LaSalle for greater ability and larger success. So decide today to take the first step to better your own future.

Check the career of your choice in the coupon below and we'll send you by return mail, without obligation, full information on that field—the opportunities, and what you must know to be successful.

You can win Success if you train for Success.

Mail the Coupon Today

LASALLE EXTENSION UNIVERSITY

A Correspondence Institution

417 So. Dearborn St. Dept. 283R, Chicago 5, Ill.

Please send me, without obligation, full information on the field I have checked below:

- ☐ **LASALLE ACCOUNTING:** Training for position as Accountant, Auditor, Controller, Cost Accountant, Public Accountant, etc.
- ☐ **LAW:** Training in Law as a foundation for business or professional success. Degree of LL.B.
- ☐ **TRAFFIC & TRANSPORTATION:** Training for position as Motor Truck or Industrial Traffic Manager, Railroad; Rate Expert, Freight Solicitor, etc.
- ☐ **CPA TRAINING:** Advanced training in preparation for the Uniform CPA examination.
- ☐ **BUSINESS MANAGEMENT:** Training for Managerial, Sales and Department Executive positions.
- ☐ **STENOTYPE:** Training for position as Stenographer, Secretary or Executive Secretary using Stenotype Machine.
- ☐ **STENOGRAPHIC-SECRETARIAL:** Training for position as Stenographer, Secretary or Executive Secretary using Gregg Shorthand System.

Name.....*Age*.....

Address.....

City, Zone & State.....

LINGUAPHONE

MAKES IT EASY TO LISTEN and LEARN to *Speak*

SPANISH [American or European] • **FRENCH**
GERMAN • ITALIAN • JAPANESE
MODERN GREEK • ICELANDIC

Any of 34 languages available at home

Only LINGUAPHONE. The World's Standard *Conversational* Method, brings 8 to 12 of the world's best native language teachers into your home on fine, life-like recordings.

It's like living in another land. You listen. You hear native men and women converse about up-to-date, everyday matters. You Understand. You SPEAK quickly, easily, naturally. *You acquire a true accent no TEXTBOOK CAN TEACH.*

Exciting Business, Travel Opportunities Here and Abroad.

Linguaphone is used around the world by schools, governments, business firms. Over a million home-study students of all ages have learned another language this ideal, conversational way.

Stop Wishing—Start Talking! Send for FREE Book and Details of FREE TRIAL. **Linguaphone Institute, T-147-028 Radio City, New York 20, N. Y.**

3-PASS. SPORT CAR
Ideal 2nd Car or Sportabout. Fully Equipped. Write For Literature.

ESHELMAN TRACTORS LOW AS $99

For Better Lawns and Gardens investigate Eshelman Riding Rotary Mowers, Tillers, Tractors. Advertised in **Good Housekeeping.** Thousands of Satisfied Users. Write for Free Literature.

Dept. 105, ESHELMAN, 109 Light St., Balto. 2, Md.

Shipping Points: BALTIMORE • CHICAGO • RENO

Riding Mower $272.25

LEARN PLASTICS

COMPLETE LOW COST SHOP METHOD HOME TRAINING NOW AVAILABLE

Get in on Big Money opportunities in Plastic molding, casting, forming, carving, etc. Earn as you learn with Interstate's professionally prepared course. All plastic materials furnished.

WRITE FOR FREE BOOKLET

INTERSTATE TRAINING SERVICE
DEPT. C-2, PORTLAND 13, OREGON

KEY PURSE 50c

NEW! Practical, compact KEY PURSE with card case, snap coin purse and 6 key hooks that positively holds keys in place. Natural tooling goat LEATHER, pre-cut ready to tool or stamp, has that "expensive look". Size: 2½" x 3¾". KIT complete, holes punched, snaps and key plate attached, goat lacing, easy instructions and pattern. **50c postpaid.**

FREE — 100 PAGE LEATHERCRAFT CATALOG

TANDY LEATHER CO. *(Since 1919)*
P. O. BOX 791-DT FORT WORTH 1, TEXAS

RCA INSTITUTES OFFERS YOU THE FINEST OF HOME STUDY TRAINING

The equipment illustrated and text material you get with each course is yours to keep. Practical work with very first lesson. Courses for the beginner and the advanced student. Pay-as-you-learn. You need pay for only one study group at a time.

SEND FOR THIS FREE BOOK NOW

RCA Institutes, Inc. Home Study Dept. PS-28
A Service of Radio Corporation of America
350 West Fourth Street, New York 14, N. Y.

Without obligation, send me FREE 52 page CATALOG on Home Study Courses in Radio, Television and Color TV. No Salesman will call.

Name.....
Please print

Address.....

City.....Zone....State.....

Korean Vets! Enter discharge date_____

IN CANADA — RCA VICTOR COMPANY, LTD.
5001 Cote de Liesse Rd., Montreal 9, Que.

RESIDENT SCHOOL courses in New York City offer comprehensive training in Television and Electronics. Day and evening classes start four times each year. Detailed information on request.

To save time, paste coupon on postcard

OPTICAL BARGAINS

3" ASTRONOMICAL REFLECTING TELESCOPE
(Famous Mt. Palomar type)
See the Stars, Moon, Planets Close Up!
60 & 120 Power—An Unusual Buy!

Assembled and Ready to Use! You'll see the Rings of Saturn, the fascinating planet Mars, huge craters on the Moon. Aluminized and overcoated 3" diameter high-speed f/10 astronomical mirror. Telescope comes equipped with a 60X eyepiece and a mounted Barlow Lens, giving you 60 & 120 power. Optical Finder Telescope, included. Sturdy, hardwood, portable tripod. Free with scope: Valuable STAR CHART and 272 page "Astronomy Book."
Stock No. 85,050-N ..... **$29.50 f.o.b. Barrington, N. J.**
(Shipping wt. 10 lbs.)

4¼" ASTRONOMICAL TELESCOPE

Mt. Palomar type! Up to 270 Power. A fine Reflector Telescope complete with real Equatorial Mount and Tripod and 6X Finder. Aluminum tube, 4¼" dia. mirror, rack and pinion focusing eye-piece holder, 2 eyepieces and mounted Barlow Lens for 40X, 90X, 120X and 270X. Shipping weight approx. 25 lbs. **Stock No. 85-006-N . . . complete, $74.50 f.o.b. Barrington, N. J.**

DIRECT MEASURING POCKET MICROSCOPE — 50 POWER

Fountain pen size, makes direct reading measurements; for checking small parts and dimensions under powerful magnification. Precision, glass etched reticle calibrated for measurements up to 1/10" by .001" divisions.
STOCK NO. 30,225-N ..... **$7.95 Pstpd.**

New! 2 in 1 Combination! Pocket-Size
50 Power MICROSCOPE and 10 Power TELESCOPE

Useful Telescope and Microscope combined in one amazing, precision instrument. Imported! No larger than a fountain pen. Telescope is 10 Power. Microscope magnifies 50 Times. Sharp focus at any range. Handy for sports, looking at small objects, just plain snooping. **Send Check or M.O. Satisfaction Guaranteed.**
Order Stock No. 30,089-N ..... **$4.50 Pstpd.**

Geophysical Year Scoop
REAL 150 POWER ASTRONOMICAL TELESCOPE
ONLY $16.95 Postpaid

Refractor type! Clear, razor-sharp viewing of stars, planets, craters on moon, etc. 32mm achromatic objective lens! First surface mirror diagonal (ends "stoop" viewing!). Removable eyepiece—interchangeable, 50, 75, and 150 power! Tube length 27½". Special attachment clamp for vibrationless viewing. Money back guarantee. Included free: 273 page "Handbook of the Heavens," Star Chart—and 16 page Star Booklet.
Stock No. 80,060-N ..... **$16.95 Postpaid**

Larger 42mm objective model—67, 100, 200 power—same features as above, with 38" tube length—(included free: "Handbook of the Heavens," Star Chart and 16 page Star Booklet).
Stock No. 80,061-N ..... **$19.95 Postpaid**

See The Satellites
NEW, LOW PRICE "SATELLITER" TELESCOPE

Get ready for a terrific sky show as more Satellites are vaulted into space. See thrilling sights with our amazing Satellite Scope at unheard of low cost. Also view comets—use as a Rich-field Scope for viewing star clusters. 5 power—wide 12° field. Use of high quality war surplus optics makes possible this bargain.
Stock No. 70,150-N ..... **$9.95 Postpaid**
We are the mfg. of the famous "Moonwatch" Satellite Telescope!

BUILD A SOLAR ENERGY FURNACE

A fascinating new field. Build your own Solar Furnace for experimentation—many practical uses. Easy! Inexpensive! We furnish instructions. This sun powered furnace will generate terrific heat—2000° to 3000°. Fuses enamel to metal. Sets paper aflame in seconds. Use our Fresnel Lens—14¾" diameter . . . f.l. 14".
Stock No. 70,130-N—package of 1 ..... **$ 6.00 Pstpd.**
Stock No. 70,131-N—package of 2 ..... **$11.00 Pstpd.**
Stock No. 70,132-N—package of 4 ..... **$20.00 Pstpd.**

INFRARED SNIPERSCOPE TELESCOPE & PARTS

See in the dark—without being observed. War surplus Sniperscope M-2. Gov't cost about $1200. Instrument complete, ready to use. Includes Power Pack, infrared light source. Will operate from 6 V auto battery. Battery or transformer available.
Stock No. 85,053-N ..... **$150.00 f.o.b.**

Save still more money! Build your own Sniperscope! We will furnish instructions—parts, including: Power Packs, IP25A image tubes, light units, filters, etc. For details—request FREE CATALOG "N"

WRITE FOR FREE CATALOG "N"!

Complete Line of Astronomical Telescope Parts and Assembled Telescopes. Also huge selection of lenses, prisms, war surplus optical instruments, parts and accessories. Telescopes, microscopes, satellite telescopes, binoculars, etc. Request Catalog "N"!

ORDER BY STOCK NUMBER SEND CHECK OR MONEY ORDER SATISFACTION GUARANTEED
EDMUND SCIENTIFIC CO., BARRINGTON, N. J.

unlimited opportunity for graduate engineers

Demand for our engineering graduates exceeds supply. Important firms visit campus regularly to interview seniors. Industrial growth . . . automation . . . technical advances create career opportunities for engineers, accountants, management experts. Share rewards awaiting college men . . . higher income . . . rapid advancement. Grasp your chance for a better life *now!* Start any quarter in this world-famed college. *Approved for veterans.*

Bachelor of Science degree in 27 months

In Mechanical, Civil, Electrical, Chemical, Aeronautical, Radio (TV-Electronics) Engineering. *In 36 months a B.S. in Business Administration* (General Business, Accounting, Motor Transport Management majors). Superior students may accelerate. 36-weeks course in Drafting. *Intensive program:* technical fundamentals stressed; comprehensive courses with more professional class hours. *Small classes:* personalized instruction. Enrollment limited. Preparatory courses. *Beautiful campus.* Well-equipped, new and modernized buildings and laboratories. Enter Mar., June, Sept., Jan. Earnest, capable students (whose time and budget require accelerated courses and modest costs) are invited to *write Jean McCarthy, Director of Admissions, for catalog and book "Your Career in Engineering and Commerce."*

TRI-STATE COLLEGE
528 College Avenue Angola, Indiana

LEARN AT HOME IN SPARE HOURS

BE A LOCKSMITH

Learn fascinating, profitable trade from experts in spare time at home! Age or physical handicap no disadvantage. Year around, steady income. Full or part time. Practical, illustrated lessons. Make money even while learning! All materials and special tools supplied. **Free Booklet.**

Locksmithing Institute, Dept. PS-98
150 Park Avenue E. Rutherford, N. J.
Lic. by N. J. State Board of Ed. Approved for Vets

"I Made $14,839 in 1 Year SERVICING RADIATORS!"

Are you earning under $8,000 a year? Hundreds now making $10,000-$12,000-$15,000 a year servicing auto-truck-tractor radiators the Inland way. Easy to learn. Inland, largest radiator equipment mfgr., offers complete package—equipment, merchandising, "Pays-for-itself" financing, free training. $305 down for equipment starts you. Profitable dept. for garage or service station. Write to

INLAND MFG. CO., Dept. PS-2, 1108 Jackson St., Omaha 7, Nebr.

Secrets of* VENTRILOQUISM *Now Revealed!

Easy to learn in 60 to 90 days with our Home Study Course. **RESULTS GUARANTEED.** Make Money! Be Popular! Have Fun! Big Opportunity! Radio, Television, Stage Appearances! For Free Information regarding price and course, WRITE. You must state your age. Dummy Catalog 25c.
MAHER HOME COURSE OF VENTRILOQUISM
Box 36, Studio PS-2, Kensington Station
Detroit 24, Michigan

POSITIVELY NO SELLING!

I made $20,000 in one year without selling a thing—door to door, over the counter, by mail, or any other way. All I did was buy up junk jewelry. Then Uncle Sam paid me $35.00 an ounce for the gold in it, less a small handling and refining charge. Send me your name and address and I'll show you how it's done.

I claim there never was a more interesting way to make money. Positively no selling because the U. S. Government is eager to buy all the old gold you turn in—*at the established price.* Just follow my plan and you can find junk jewelry to buy in any community—large or small. I show you where to find it, what to pay for it, how to test it and how to mail it to Uncle Sam for immediate cash. I'll teach you the secrets by which I made $20,000 in a year with *absolutely no selling.* No charge for facts. No salesman will call. Send no money—just name, address on postcard. Write now to: **LESLIE PATTON, 335 West Madison Street, Dept. 12-B, Chicago 6, Ill.**

We'll train & establish you in

Your Own Business

. . . even if now employed

We are enlarging this 28-year-old world-wide chain of Duraclean dealerships. Many excellent locations are still available in the U.S.A., Canada, and other countries. If you are reliable and diligent, this is an opportunity to increase your income . . . and have the freedom, financial independence, and prestige of YOUR OWN business.

These are full time dealerships . . . but you can start in spare time and have a profitable, lifetime business when your present job ends. A Duraclean dealer will train and assist you. He'll reveal his successful, proven methods and sales plans. He'll **work with you.**

Alert dealers can average $9 hourly gross profit on service they render plus $6.60 on EACH service-man at National Price Guide charges. This business is **easy** to learn . . . quickly established.

World-wide Service
FREE Booklets tell how!

You Become an Expert

in cleaning and protecting Rugs and Upholstery

A Duraclean Dealership qualifies you to offer **five** different services. Thus on many jobs you **multiply** profits.

1. DURACLEAN: Unique ABSORPTION process for cleaning rugs, carpets, upholstery. Recommended by leading stores and manufacturers. No scrubbing, soaking, shrinkage. Aerated foam manufactured by portable electric Foamovator, safely removes dirt, grease, unsightly spots. Dries so fast customers use furnishings in few hours.

2. DURASHIELD: Soil-retarding treatment that KEEPS furnishings clean MONTHS longer. So now you may be the **first in town** to offer this type service.

3. DURAPROOF: Protects against damage by moths, carpet beetles. Only such treatment backed by an International 6-year Warranty!

4. DURAGUARD: Another new service exclusively developed for Duraclean dealers. A flame-proofing treatment which reduces fire damage by retarding charring and the tendency of fires to flame up. Theaters, restaurants, and hotels, as well as homes, offer a huge potential.

5. SPOTCRAFT: Special chemical products which enable you to handle most all spot or staining problems means extra business, greater customer satisfaction, and added prestige for you as a professional craftsman.

Easy to learn • No Overhead Expense

Permanent, Growing Market

Service is rendered **IN** homes, offices, hotels, theaters, institutions and to revive used-car upholstery for auto dealers. There is need for these services in almost every building. Duraclean dealers operate from their home, an office or shop, as they prefer. It's **easy to learn** . . . we quickly train you. Rendering service yourself, at first, prepares you to train and supervise service men.

Repeat and Voluntary Orders

Demonstrations win new customers. DURACLEAN Dealers find REPEAT and VOLUNTARY orders a major source of income. Customers, enthused with results, tell friends and neighbors. Furniture and department stores and others turn over rug and upholstery cleaning and mothproofing to **DURACLEAN** Dealers. We show you **27 ways** to get new customers.

We Help YOU Grow

Our **MUTUAL COOPERATION** program gives you many unique and continuous advantages: **National Advertising** in Life, McCall's, House & Garden, Canadian Homes & Gardens and a dozen others. **Copyright and trademark** protection. **Certificate** approves equipment and materials. **Products Insurance. Six-year Warranty. Pocket Demonstrators. Sales Book. Advertising Folders & Cards. Tested Ads. Ad Cuts & Mats. Store Display Cards. Radio & TV Musical Commercials.** Home Show **Booth Display. Publicity Program** gets FREE local newspaper stories. **Prizes. Laboratory** research and development. **Monthly Magazine. Resale Service. Annual Conventions.** Behind all this is a **28-YEAR-OLD** headquarters interested in YOUR personal success. If you want to become the owner of a **DURACLEAN** Service business, you should inquire now, TODAY, while territory is still available.

What Dealers Say

M. Lyons (Chgo): 2nd year should bring me $100,000 . . . 1st year was $40,000. Hdqrs. constant help made it possible.
E. F. Smith (Huron, S. D.): I'm 80 and do all servicing myself. One job, Hotel Tams brought $850.00.
W. Lookiebill (St. Louis): For many customers, I've (Dura)cleaned every year since I started 27 years ago.
E. Roddy (Hampton, Va.): First 12 days of January I did $600 business . . . supposed to be an off month.
A. Wilson (Tulsa): Never been so sold on anything in my life . . . out-performs anything offered by my competition.
T. Komori (Japan): We have 1,000,000 yen contract (Dura)cleaning for the U.S. Army.

EASY TERMS

A moderate payment establishes your own business—pay balance from sales. We furnish electric machines, folders, store cards, introduction slips, sales book, demonstrators and enough material to return your TOTAL investment.

FIRST PROCESS IN THE FIELD TO WIN THIS IMPORTANT HONOR!

As a Duraclean dealer, your services are backed by this famous seal of quality . . . proof that Duraclean has passed rigorous tests. No competitor in your town can boast this seal. Duraclean has also been tested and certified by the American Research & Testing Laboratories. No wonder it's so easy to get business!

FREE Booklets

Our first letter and illustrated booklets will explain everything—the two modern, urgently needed services, waiting market, how business grows, your large profit, easy terms and PROTECTED territory. Clip and mail coupon today! **Get all the facts . . . no obligation.**

Duraclean® Co. 8-182 Duraclean Bldg. DEERFIELD, ILLINOIS

Mail Coupon—We'll Send You FREE Booklets!

"OWN a Business" Coupon

DURACLEAN CO., 8-182 Duraclean Bldg., Deerfield, Illinois

Without obligation to me, send booklet and letter giving full details. Tell me how I may OWN a growing business of my own built upon satisfied customers.

Name_____

Address_____

City_____ County_____ State_____

Advertisement

The Amazing Potentialities of Memory

I LITTLE thought when I arrived at my friend Borg's house that I was about to see something truly extraordinary, and to increase my mental powers tenfold.

He had asked me to come to Stockholm to lecture to the Swedes about Lister and other British scientists. On the evening of my arrival, after the champagne, our conversation turned naturally to the problems of public speaking and to the great labour imposed on us lecturers by the need to be word perfect in our lectures.

Borg then told me that his power of memory would probably amaze me—and I had known him, while we were studying law together in Paris to have the most deplorable memory!

So he went to the end of the dining room and asked me to write down a hundred three-figure numbers, calling each one out in a clear voice. When I had filled the edge of an old newspaper with figures, *Borg repeated them to me in the order in which I had written them down and then in reverse order, that is beginning with the last number. He also allowed me to ask him the relative position of different numbers: for example, which was the 24th, the 72nd, and the 38th, and I noticed that he replied to all my questions at once and without effort, as if the figures which I had written on the paper had been also written in his brain.*

I was dumbfounded by such a feat and sought in vain for the trick which enabled him to achieve it. My friend then said: "The thing you have just seen and which seems so remarkable is, in fact, quite simple; everybody has a memory good enough to do the same, but few indeed can use this wonderful faculty."

He then revealed to me how I could achieve a similar feat of memory, and I at once mastered the secret—without mistakes and without effort—as you too will master it tomorrow.

But I did not stop at these amusing experiments. I applied the principles I had learned in my daily work. I could now remember, with unbelievable facility, the lectures I heard and those which I gave myself, the names of people I met—even if it was only once—as well as their addresses, and a thousand other details which were most useful to me. *Finally, I discovered after a while that not only had my memory improved, but that I had also acquired greater powers of concentration; a surer judgment—which is by no means surprising since the keenness of our intellect is primarily dependent on the number and variety of the things we remember.*

If you would like to share this experience and to possess those mental powers which are still our best chance of success in life, ask L. O. Borg to send you his interesting booklet *The Eternal Laws of Success*—he will send it free to anyone who wants to improve his memory. Here is the address: *L. O. Borg, c/o Aubanel Publishers, 14 Lower Baggot St., Dublin, Ireland.*

Write now—while copies of this booklet are still available.

L. CONWAY.

INSURED TIRE SERVICE
POPULAR BRANDS
FREE INSURANCE POLICY given with each used tire sold. We guarantee the amount of service you pay for.
NOWHERE CAN SUCH QUALITY BE FOUND AT SUCH LOW PRICE!
SPECIALS! Deduct 10% on orders for Two or More used tires
YOU CAN'T LOSE!!

GOODYEAR SUBURBANITE TYPE SNOW TIRES
New Tire Guarantee—Factory Rebuilt
BEST WINTER TRACTION OF ALL!
670x15 600x16 $9.95 | 710x15 650x16 650x15 760x15 800x820x15 $10.90

Super Quality — Rugged Performance — 6 Months Insured Service

600x16	$3.65	670x15	$3.95	700x16	$4.45	760x16	$4.75
650x15	3.85	670x16	4.05	710x15	4.35	820x16	4.95
650x16	4.25	700x15	3.95	760x15	4.45	550x17	4.65

Supreme Quality—Nothing Finer—12 Months Insured Service

600x16	$5.25	475x19	$5.45	700x15 (6)	$10.45	700x20	$12.90
600x16 (6)	6.75	640x15	4.95	750x16 (8)	15.95	750x20 (8)	15.50
650x16	5.75	670x15	5.35	700x17	11.95	750x20 (10)	17.50
650x16 (6)	7.25	710x15	5.45	750x17	16.45	825x20	21.50
700x16	6.35	760x15	5.95	750x15	10.95	900x20	19.95
750x16 (6)	8.45	800x15	6.35	30x5	11.25	1000x20	20.45
550x18	4.95	820x15	6.35	600x20	10.95	1100x20	21.25
550x17	4.75	550x16	5.35	650x20	11.75	1000x22	21.95
650x15	5.25	670x16	5.15	32x6 (8)	11.95	1100x22	22.75
700x15	5.35	700x16 (6)	10.25	32x6 (10)	12.75	1100x24	25.95

Whitewalls $1.00 extra.

MIDLAND TIRE SALES
Speedy shipments on Mail Orders. F.O.B. Chicago. Insurance policy sent with each order. Deduct 10% on orders for 2 or more used tires. Send CHECK or MONEY ORDER.—No COD's.
3701 S. Normal, Dept. SS-64, Chicago 9, Ill.

ANOTHER OF INDUSTRY'S
MOST-WANTED MEN
Electrical Engineering Technician—interesting, rewarding future for men with basic qualifications. Let I.C.S. help you prepare yourself.

SEE SPECIAL OPPORTUNITY CHECK-LIST—PAGE 51

MEN WANTED
Earn $100 Per Week and up
AUTO DIESEL MECHANICS
Master a trade with a future—learn Auto-Diesel mechanics in our shops. You learn with tools on real equipment. Earn while you learn. Many of our graduates earn $100 per week and up. No previous experience necessary. Day and night courses. Approved for veterans. Write for free bulletin.
NASHVILLE AUTO-DIESEL COLLEGE
226 7th Ave., N., Dept. 41 Nashville 3, Tenn.

CASTING SECRETS REVEALED!
Now you can learn how to make big money by casting thousands of perfect plaques, book ends, figurines, etc., with X-L rubber molds.
NO EXPERIENCE, VERY LITTLE CAPITAL NEEDED
X-L, Rubber, Pts. $2.50; Qts. $4.00 (postage extra). Molds and enough rubber for three molds, $1.50 prepaid. U.S. only. Send 25c (refunded with order) for informative catalog (40 pages) describing this wonderful, exciting *Profit-making* business.
HUGE PROFITS! MORE MONEY!
PLASTIC ARTS STUDIO 3403 S. MADISON, DEPT. 3 MUNCIE, INDIANA

BUILD and FLY
Bensen
HELICOPTER
Glider type 'copter—easy to build, simple to fly. Can also be mounted on floats or boat. No pilot's license required. Order 3-view drawings, specs and photo for $1. Motor powered Gyro-Copter drawings $2.
Send $1 or $2
Ask about detailed plans and construction kits.
BENSEN AIRCRAFT CORP., Dept. PS-28
P. O. Box 2725, Raleigh, N. C.
Name.....
Address.....

Superior's New Model 70 UTILITY TESTER®

FOR REPAIRING ALL ELECTRICAL APPLIANCES MOTORS • AUTOMOBILES • TV TUBES

As an electrical trouble shooter the Model 70:

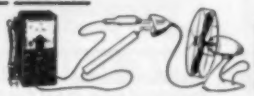
- Will test Toasters, Irons, Broilers, Heating Pads, Clocks, Fans, Vacuum Cleaners, Refrigerators, Lamps, Fluorescents, Switches, Thermostats, etc.
- Will test all TV tubes for open filaments, inter-element shorts, burned out tubes, etc.
- Measures A.C. and D.C. Voltages, A.C. and D.C. Current, Resistances, Leakage, etc.
- Will measure current consumption while the appliance under test is in operation.
- Incorporates a sensitive direct-reading resistance range which will measure all resistances commonly used in electrical appliances, motors, etc.
- Leakage detecting circuit will indicate continuity from zero ohms to 5 megohms (5,000,000 ohms).

As an Automotive Tester the Model 70 will test:

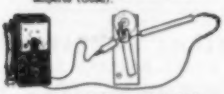
• Both 6 Volt and 12 Volt Storage Batteries • Generators • Starters • Distributors • Ignition Coils • Regulators • Relays • Circuit Breakers • Cigarette Lighters • Stop Lights • Condensers • Directional Signal Systems • All Lamps and Bulbs • Fuses • Heating Systems • Horns • Also will locate poor grounds, breaks in wiring, poor connections, etc.

IT'S SO EASY!!

With tester's cord in outlet, current consumption of appliance is read direct on meter when line cord is connected to receptacle on panel. This typical iron takes 7 amperes (Good).



Small electric fan motor indicates 50 ohms (normal resistance).



Control circuits of most furnaces use 24 volts obtained from step-down transformer. Here's how to check room thermostat to see if wires to it are live.

Manual supplied with Model 70 shows meter needle moves to right when test leads are connected to pins 3 and 4 of this 6AU6 tube. Procedure for testing all tubes used in TV are detailed in manual.

Test Generators — Test Auto Fuses — Test Storage Batteries — Test Circuit Breakers

READ THIS! **READ THIS!** **READ THIS!**

INCLUDED FREE!!

This 64-page book—practically a condensed course in electricity. Learn by doing.

Just read the following partial list of contents:

• What is electricity? • Simplified version of Ohms Law • What is wattage? • Simplified wattage charts • How to measure voltage, current, resistance and leakage • How to test all electrical appliances and motors using a simplified trouble-shooting technique.

• How to test all TV tubes; also simple procedure for determining which specific tube (or tubes) is causing the trouble.

• How to trace trouble in the electrical circuits and parts in automobiles and trucks.

Model 70 comes complete with above book and test leads. Only . . . **$15.85**

You don't pay for the Model 70 until AFTER you have examined it in the privacy of your home! Model 70 is

SHIPPED ON APPROVAL

NO MONEY WITH ORDER — NO C.O.D.

Try it for 10 days before you buy. If completely satisfied then send $3.85 and pay balance at rate of $4.00 per month for 3 months — No Interest or Finance Charges Added! If not completely satisfied, return to us, no explanation necessary.

MOSS ELECTRONIC DIST. CO.
Dept. D-428 3849 Tenth Ave., New York 34, N. Y.

Please rush me one Model 70. If satisfactory I agree to pay $3.85 within 10 days and balance at rate of $4 per month until total price of $15.85 plus postage is paid. If not satisfactory, I may return for cancellation of account.

Name _____

Address _____

City _____ Zone _____ State _____

Make $500 an Hour CASH PROFIT

THE DAY YOU START!

START YOUR OWN BUSINESS AT HOME . . . SHARPEN HOUSEHOLD, GARDEN AND SHOP TOOLS IN SPARE TIME

Now you can turn your spare time into Big Cash Profits with new BELSAW SHARP-ALL. Sharpen knives, scissors, shears, snips, ice skates, mower blades, hedge trimmers, grass whips, axes, chisels, screw drivers, scrapers and saws . . . just about any household, garden and shop tool. Your own CASH business in 15 square feet of your basement or garage . . . all your prospects in your own neighborhood. No calls to make. No experience needed. No inventory. Your SHARP-ALL quickly pays for itself.

FREE BOOK

FREE BOOK tells how to start your own cash business.

Learn how easily you can start your own spare time business. Amazing low cost, easy-payment plan. Send coupon today for FREE BOOK.

BELSAW SHARP-ALL CO
708 Field Building • Kansas City 11, Missouri
Send me your FREE BOOK.

Name_____

Address_____
City and
State_____

BECOME AN EXPERT IN TRAFFIC and TRANSPORTATION

TODAY qualified men in this field earn $4,000 to $10,000 and up. Thousands are needed. We train you in spare time at home for executive positions in Traffic Management.

LaSalle's complete Traffic and Transportation program gives you a thorough knowledge of this field. Program covers Transportation Agencies—How to Ship by Rail, Express, Water, MOTOR TRUCK, Air, Freight Forwarder and Mail Carriers.

Investigate the splendid opportunities available. Low cost-easy terms. Placement counsel and help. Write today for FREE 48-page book "Traffic and Transportation —the Fast Growing Profession."

LASALLE EXTENSION UNIVERSITY
A Correspondence Institution
417 S. Dearborn St., Dept. 283T, Chicago 5, Illinois

MONEY for MEN ALL DATA FREE

THE PLASTEX industry needs manufacturers on small scale and for big production of Lamp and Clock Stands, Art Goods and Novelties in Plastex and Marble imitation. Experience unnecessary. ½c material makes regular 10c store sellers. Rubber moulds furnished for speed production. Small investment brings good returns. We are now placing big chain store orders with manufacturers. Ambitious men have chance for real prosperity. Our Free booklet will interest and benefit you.

PLASTEX INDUSTRIES, Dept. 2, 3400 Third Ave., New York 56, N.Y.

FIX OUTBOARD MOTORS

POWERMOWERS, AND ALL SMALL 2 & 4-CYCLE GASOLINE ENGINES

Repair your own equipment or MAKE EXTRA MONEY in this growing field. Fully illustrated, easy-to-understand, Home Study Course. Write for FREE information.

LINCOLN TECHNICAL INSTITUTE
SUITE 2-G, 472 MARKET STREET, NEWARK 5, N. J.

PERFECT HAND PRINTING WITH STENSO PAL

IT'S FAST, EASY WITH "STENSO" COMPLETE LETTER & NUMBER GUIDES

GOTHIC: ½, ¾, 1, 1¼, 1¾ in. includ.
ROMAN: ½, ¾, 1, 1½, 2 inch included
OLD ENGLISH: 1, 1¾, 2½, in. includ.
$1.50 per set

No training needed. Just put pencil in stencil, draw perfect letters. Ideal for stores, schools, offices, clubs. Pays for itself. Use over and over. Made of heavy stencil board. Free catalogue.

At Stationery, Variety, Art Hobby Stores or Order From **STENSO LETTERING CO.** Dept. 208 Balto. 18, Md.

FREE LAFAYETTE CATALOG

JUST OFF THE PRESS!
NEW 180 PAGE ELECTRONIC CATALOG FEATURING THE BEST BUYS IN THE BUSINESS

Packed with the largest selection of Electronic, Radio and T.V. Parts, and equipment, PA, Hi-Fi systems, tubes, antennas, Transistor Kits, parts and components, Test Equipment, new build your own kits, tools, books, Microscope, drafting equipment, Binoculars, Telescopes. All Radio, TV and Ham supplies—ALL AT GREAT SAVINGS! —For the economy minded serviceman, dealer, engineer and technician. CHUCK FULL OF BUYS! SEND FOR YOUR FREE COPY TO-DAY.

Name_____
Address_____
City_____ Zone____ State____

Lafayette Radio 165-08 LIBERTY AVE JAMAICA 33, N. Y.

WHAT ALL AUTO MECHANICS WANT TO KNOW

This Big Practical Book gives full information, with working diagrams, covering the principles, construction, ignition, service and repair of modern cars, trucks and buses.

Diesel Engines, Hydromatic and Fluid Drives Fully Explained.

A complete guide of 1096 Pages, with over 1500 Illustrations showing inside views of working parts, with instructions for service jobs. Completely up-to-the-minute! Priced at only $6.

CIRCLE No. 1 IN COUPON

HOW TO FIX HOME APPLIANCES

REFRIGERATORS WASHERS — TOASTERS DRYERS — IRONERS RANGES — VACUUMS FREEZERS

Many other GAS AND ELECTRIC APPLIANCES

Handy Reference for Electric & Gas Servicemen, Mechanics, Dealers and Homeowners. Explains clearly and simply how to locate troubles, how to test, reassemble and connect. Wiring diagrams. 1000 Facts. Easy to read. Answers ALL your questions. 864 Pages. Illustrated. Only $4.

CIRCLE No. 2 IN COUPON

TV RADIO SERVICE LIBRARY

TELLS HOW TO ANSWER RADIO T.V. QUESTIONS

HERE IS LATE INFORMATION IN A HANDY FORM FOR RADIO AND TELEVISION REPAIRMEN, SERVICEMEN AND STUDENTS

TWO COMPLETE VOLUMES—1568 Pages—1085 Illustrations and Diagrams. 1001 Important Facts and Figures on Modern T.V., Radio, Electronic Devices. INCLUDES TRANSISTORS & Transistor Circuits, Rectifiers, Record Changers, P.A. Systems, Phonograph Pick-ups, F.M., Auto Radio, Short Wave, Basic principles, Construction, Installation, Operation, Repairs, Trouble Shooting. How to get Sharp, Clear T.V. Pictures. Install Aerials. How to Test. Explains COLOR SYSTEMS. Methods of Conversion, Terms, etc. Includes Ultra High Frequency. Quick ready reference or use as a home study course. Only $8 for BOTH volumes.

CIRCLE No. 3 IN COUPON

KNOW YOUR TRUCK

The TRUCK & TRACTOR GUIDE for Mechanics & Drivers, Foremen, Garagemen, Helpers, Owners, Trouble Shooters, Farmers, etc. Covering Gas & Diesel Motor Principles—Construction—Operation—Maintenance—Repair—Brakes—Service of all Parts. 1376 Pages. FULLY ILLUSTRATED. Index. Only $5.

CIRCLE No. 5 IN COUPON

PLUMBERS AND STEAMFITTERS GUIDES

Practical Trade Assistant & Reference Set. Explains in plain language and by clear illustrations, diagrams, charts, graphs and pictures the principles of modern plumbing practice including Pipe Fitting and Air Conditioning. 4 Vols.—2624 Pages—3642 Diagrams & Illustrations. Only $8 for the complete set of 4 vols.

CIRCLE No. 6 IN COUPON

PAINTING & DECORATING MANUAL

Inside Trade information on outside and inside work, how to mix paints, preparation of surfaces, paper hanging, wood finishes, tools, synthetic paints, color (with color chart), spray equipment, costs, estimating, etc. A COMPLETE guide to easier, better painting and decorating. 464 Pages. Fully Illustrated. Only $2.

CIRCLE No. 7 IN COUPON

7-DAY FREE EXAMINATION

SEND NO MONEY—Pay the postman nothing! We are glad to send you any of the Audel Guides for absolutely FREE examination in your own home. We take all the risks and leave all the decisions up to YOU. There is no obligation! If you decide to keep the books of your choice you may pay for them under our astounding easy-pay plan of only $2 a month.

HERE IS ALL YOU DO

IT'S EASY TO ORDER: In the *No-Risk* Mail Order Coupon at the right just draw a circle around the number of Audel Guides you want us to send you for FREE EXAMINATION. We will send them to you at once to help you build a brighter future by increasing your SKILL. If for any reason at all you are not COMPLETELY satisfied, return the books to us, and that will end the matter! NO STRINGS OR CATCHES TO THIS OFFER.

THEO. AUDEL & CO.
49 West 23rd Street, New York 10, N.Y.

CARPENTERS AND BUILDERS GUIDES

PRACTICAL STOREHOUSE OF MODERN CONSTRUCTION INFORMATION (4 vol. set) for carpenters and all woodworkers. Explains in easy language and by profuse illustration principles, advances, short cuts, trade secrets, all based on the NEWEST information.
Vol. 1—Tools, steel square, new Roofing, joinery, furniture, etc.; Vol. 2—Builders' mathematics, drawing plans, specifications, estimates, etc.; Vol. 3—Doors, windows, stair building, millwork, painting, etc. 4 vols. 1904 Pages. 2700 Illustrations. Whole set only $8.

CIRCLE No. 8 IN COUPON

PRACTICAL ELECTRICITY

A COMPLETE HANDBOOK—Quick, simplified, ready reference. Complete instruction and practical information on the rules and laws of electricity—Maintenance of Machinery—A.C. and D.C. Motors—Armatures—Wiring Diagrams—House Lighting—Power Wiring—Meters—Batteries—Transformers—etc. Simple to understand. 1520 Pages. 2600 Illustrations. Priced at $5.

CIRCLE No. 4 IN COUPON

DIESEL

ALL THERE IS TO KNOW ABOUT MODERN DIESEL ENGINES—Basic principles, starting valves, timing, fuel pumps, fuel injection compressor, air compressors, pistons, cylinders, lubrication, cooling systems, etc. Answers on operation, calculations. 840 Pages. Fully Illustrated. Priced $3.

CIRCLE No. 9 IN COUPON

WELDERS GUIDE

Covers Electric, Oxy-acetylene, Thermit, Unionmelt welding for sheet metal, spot and pipe welds, pressure vessels and aluminum, copper, brass, bronze and other metals. Airplane work, surface hardening, hard facing, cutting, brazing, etc. 608 Pages. Fully Illustrated. Only $3.

CIRCLE No. 10 IN COUPON

MATHEMATICS MADE EASY

A COMPLETE HOME STUDY COURSE—Starting with the first principles of arithmetic, advancing step by step through the various stages of mathematics, including the rules and calculations for mechanical and electrical problems. New EASY correct methods. Includes plane and solid geometry, trigonometry, algebra, calculus, etc. Practical tests, reference tables and data. How to use slide rule. 752 Pages. 550 Illustrations. Priced at only $3.

CIRCLE No. 11 IN COUPON

NEW MACHINISTS AND TOOLMAKERS HANDBOOK

MODERN MACHINE SHOP PRACTICE—5 PRACTICAL BOOKS IN ONE. New from cover to cover. Tells how to set up and operate lathes, screw and milling machines, shapers, drill presses and all other machine tools. A COMPLETE INSTRUCTOR AND REFERENCE BOOK. 1728 Pages. Fully Illustrated. Priced at only $6.

CIRCLE No. 12 IN COUPON

WIRING DIAGRAMS

This book gives the practical facts on wiring of electrical apparatus. It explains clearly and SIMPLY how to wire apparatus for all fields of electricity. Each diagram is complete and self-explaining. Know your HOOK-UPS! 304 Pages. Illustrated. Only $2.

CIRCLE No. 13 IN COUPON

REFRIGERATION & AIR CONDITIONING

FOUR BOOKS IN ONE—basic principles, servicing, operation, repair of: 1. Household Refrigeration. 2. Special Refrigeration Units. 3. Commercial & Industrial Refrigeration. 4. Air Conditioning Systems. A GOLD MINE of essential information. Completely up-to-date. 1360 Pages. Fully Illustrated and Indexed. Priced at only $6.

CIRCLE No. 14 IN COUPON

THE NEW ELECTRIC LIBRARY

A COMPLETE ENCYCLOPEDIA explaining in the simplest terms the fundamental principles, rules and applications of applied electricity.

A COMPLETE COLLEGE EDUCATION!

Fully illustrated with diagrams and sketches, calculations and tables for ready reference. Questions and answers. Trial tests for practice study and review. All based on the most modern theory.

Vol. 1—Principles and rules of electricity, magnetism, armatures, repairs. No. 13

Vol. 2—Dynamos, DC Motors, construction, installation, maintenance, etc. No. 16

Vol. 3—Testing instruments and tests, storage battery constr. and repairs. No. 17

Vol. 4—Alternating current, power factor, alternators, transformers. No. 18

Vol. 5—A.C. Motors, windings, maintenance, converters, switches, fuses, etc. No. 19

Vol. 6—Relays, condensers, regulators, rectifiers, meters, switchboards, etc. No. 20

Vol. 7—Wiring, house light and power, circuits, high tension, plans, codes, etc. No. 21

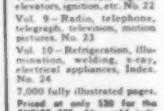
Vol. 8—Railways, signals, elevators, ignition, etc. No. 22

Vol. 9—Radio, telephone, telegraph, television, motion pictures. No. 23

Vol. 10—Refrigeration, illumination, welding, x-ray, electrical appliances, Index. No. 24

7,000 fully illustrated pages.

Priced at only $20 for the ENTIRE SET. Also sold individually for $2 each.



ALL TYPES OF BLUEPRINT READING

How to read scales, the standard symbols, detail and assembly prints, working drawings, short cuts, helps, hints and suggestions. THE MAN WHO CAN READ BLUEPRINTS IS IN LINE FOR A BETTER JOB. This book gives you the secret language, step by step in easy stages. 446 Pages, Very Fully Illustrated. Priced at $3.

CIRCLE No. 25 IN COUPON

MASONS & BUILDERS GUIDES

A PRACTICAL ILLUSTRATED 4 VOL. SET—Explaining in clear, simple language and profuse illustration, principles, advances, short cuts, trade secrets, based on modern practice—including how to figure and calculate various jobs. Vol. 1—Brick work, bricklaying, bonding, designs. Vol. 2—Brick foundations, arches, tile setting, estimating. Vol. 3—Concrete mixing, placing forms, reinforced stucco. Vol. 4—Plastering, stone masonry, steel construction, blueprints. 4 Vols. 1440 Pages. 2067 Illustrations. Complete Set only $8.

CIRCLE No. 26 IN COUPON

ELECTRIC MOTORS

THIS GUIDE covers the construction, hook-ups, control, maintenance and trouble shooting of all types of motors. Includes armature winding. Explains entire subject in great detail in simple language. Over 1056 Pages of information. 617 Diagrams. All types of motors fully illustrated and indexed for ready reference. Priced at only $5.

CIRCLE No. 27 IN COUPON

OIL BURNERS

New, complete, explaining in detail both domestic and industrial oil burners. Includes electrical hook-ups and wiring diagrams. Fully covering the theory, construction, installation, operation, testing, servicing and repair of all equipment. Indexed for ready reference. Over 416 Pages. 320 Illustrations and Diagrams. Only $2.

CIRCLE No. 28 IN COUPON

ADDITIONAL IMPORTANT TITLES

The following Audel Guides are all the best in their fields, written in clear simple fashion, all lavishly illustrated. Circle the numbers wanted in the MAIL ORDER COUPON below. All books are lent for FREE EXAMINATION.

No. 29	SHEET METAL PATTERN LAYOUTS. 1152 Pages	$7.50
No. 30	SHEET METAL WORKERS HANDY BOOK. 448 Pages	2.00
No. 31	MECHANICAL DRAWING GUIDE. 192 Pages	2.00
No. 32	MECHANICAL DRAWING AND DESIGN. 480 Pages	3.00
No. 33	ELECTRONIC DEVICES. 304 Pages	3.00
No. 34	ELECTRICIANS EXAMINATIONS. 272 Pages	2.00
No. 35	ELECTRIC POWER CALCULATIONS. Page 480	3.00
No. 36	ELECTRIC DICTIONARY. 9000 Terms	3.00
No. 37	POWER PLANT ENGINEERS GUIDE. 1368 Pages	5.00
No. 38	ENGINEERS AND FIREMANS EXAMS. 344 Pages	2.00
No. 39	OPERATING ENGINEERS LIBRARY 3 Book Set	12.00
No. 40	PUMPS, HYDRAULICS AND AIR COMPRESSORS. 1760 Pages	6.00
No. 41	HOUSE HEATING GUIDE. 1008 Pages	5.00

MAIL THIS NO-RISK COUPON TODAY!

THEO. AUDEL & CO.—Self Improvement Publishers Since 1879—
49 W. 23rd Street, New York 10, N.Y.

S-2

Please mail me for 7 days' FREE EXAMINATION the books I have circled at right. I agree to mail $2 in 7 days on each book or set ordered, and to further mail $2 a month on each book or set ordered until I have paid the purchase price, plus shipping costs. If I am not completely satisfied with my Audel Guides I may return them.

1	2	3	4	5	6
7	8	9	10	11	
12	13	14	15	16	
17	18	19	20	21	
22	23	24	25	26	
27	28	29	30	31	
32	33	34	35	36	
37	38	39	40	41	

NAME _____

ADDRESS _____

OCCUPATION _____

☐ **SAVE SHIPPING COSTS!** Check here if you enclose complete payment with order. We pay postage charges. You have same return privilege.

Even Men with No Experience are Making as High as $1,000.00 IN A MONTH!

Folks are Amazed when you Tell Them This New Kind of Protection Costs Only $4.95

A message to all men who are looking for a way to make more money faster, with one of America's greatest inventions wanted by millions.

Here's Your Opportunity to get into the BIG MONEY CLASS FAST with sensational PRESTO FIRE EXTINGUISHER

Over 3,000,000 Sold for Homes, Offices, Autos, Service Stations, Stores, Farms, Boats

Not everybody makes $1,000 in a month to start out, but read this: Florida salesman reports $600 in 1 month. Ohio man earned $2,100 in 2 months! Men everywhere, even in off hours, are rolling up amazing profits. Here's why. PRESTO's amazing new chemical, developed as secret defense during war, is 1½ to 6 times as effective as ordinary chemicals on equal weight basis. So PRESTO can be light, so handy a child can use. How about *you* cashing in on this great invention?

ONLY PRESTO HAS ALL THESE FEATURES

- Ends fire as fast as 2 seconds.
- Needs no inspection or recharging.
- Outperforms bulky extinguishers costing much more.
- Guaranteed for 20 years.

Why Large Profits Are Easy

Everyone is terrified by FIRE! Millions have been waiting for this pure, simple, inexpensive safeguard. Most people who see the dramatic 5-second demonstration want one or more. You make as much as $2.70 on every one. Get started in this rich new field now!

Complete Sales Outfit FREE!

Mail coupon for big Illustrated Sales Kit with everything you need to make fine money first day—NOW. Every day you hesitate can cost you $10, $15, even $50 you could be making! Everything FREE—no obligation—so MAIL COUPON TODAY!

BIG MONEY LIKE THIS EVEN IN SPARE TIME

Reports $80 a Week

Averaging less than a day or two a week, I have made as much as $75 to $80 a week. Walter Gable, Md.

Averages $15.20 an Hour

For every hour I devoted to PRESTO, I earned an average of $15.20. W. F. Wydallis, Ohio.

MERLITE INDUSTRIES INC. 114 E. 32nd St., Dept. P-16F New York, New York

MERLITE INDUSTRIES INC. (Presto Div.)
114 E. 32nd St., Dept. P-16F, New York 16, N. Y.

Rush me complete Sales Outfit with full details how I can make big money very first day with Presto Fire Extinguisher. All FREE, no obligation.

Name.....

Address.....

City.....Zone.....State.....

In Canada: Mopa Co., Ltd., 371 Dowd St., Montreal 1, P.Q.

Shrinks Hemorrhoids New Way Without Surgery

Science Finds Healing Substance That Relieves Pain—Shrinks Hemorrhoids

For the first time science has found a new healing substance with the astonishing ability to shrink hemorrhoids and to relieve pain—without surgery.

In case after case, while gently relieving pain, actual reduction (shrinkage) took place.

Most amazing of all—results were so thorough that sufferers made astonishing statements like "Piles have ceased to be a problem!"

The secret is a new healing substance (Bio-Dyne*)—discovery of a world-famous research institute.

This substance is now available in *suppository* or *ointment form* under the name *Preparation H.** Ask for it at all drug counters—money back guarantee.

*Reg. U.S. Pat. Off.

WORLD'S LOWEST PRICED ADDING MACHINE Vest Pocket Size FREE TRIAL

COUNTS UP TO 999,999,999 IDEAL FOR BUSINESS AND PERSONAL USE—GUARANTEED ACCURATE. Not a toy. Operates with only a finger flick. Adds, subtracts, multiplies, divides. Counts up to one billion. Pays for itself over and over. Ideal Gift—for Business, Income Tax and School use. MONEY BACK GUARANTEE. Send name and address. Pay postman only $2.95 plus postage. Beautiful rich-looking Leatherette Case included at no extra cost. Money back in 10 days if not delighted. AGENTS WANTED.

$2.95 $3.04 in Penna. Incl'g. 3% Tax

CALCULATOR MACHINE CO., (Mfrs.)
Box 126 Dept. F-82 Huntingdon Valley, Pa.

HYDRAULIC JACK REPAIRS

Earn While You Learn at Home

Millions of jacks in gas & auto-service stations, truckers, body-shops, riggers, factories, farms need servicing. We show you HOW—easy step by step directions—what tools to use. EARN UP TO $5 an hour, in spare time, in your own basement or garage. Start your own business NOW. Write for folder No. PS-2 & free bonus offer.

Institute of Hydraulic Jack Repair

P.O. Box 50, Bloomfield, N. J.

make your own Gems 36.50 f.o.b.

The Gem Maker comes complete with all necessary equipment, including a super-charged diamond blade for sawing, and all the wheels for grinding, shaping and polishing; also complete instructions. The complete equipment as shown, less motor and belt for only $36.50, f.o.b., Burlington, Wisconsin. Write today for information and literature.

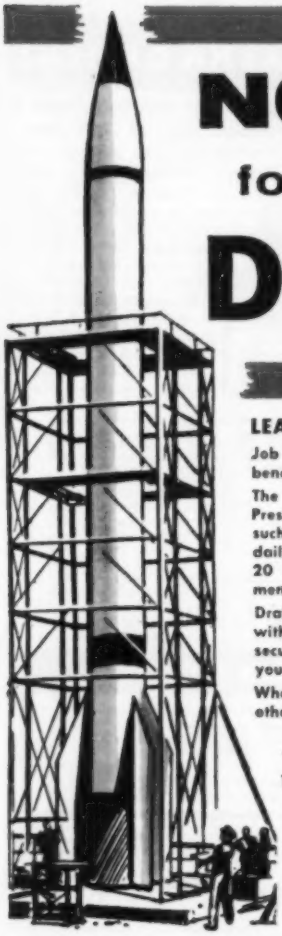
B&I MANUFACTURING CO.
Dept. S, Burlington, Wis.

New Isotronic Training Method

LEARN TV REPAIR IN ONE SHORT WEEK!

Now, after 5 year's research—a streamlined training system that *obsoletes all others!* In just 7 days you may earn $150 weekly, without paying up to $250 for training, studying long months! Developed by electronic scientists *in cooperation with major* TV mfr's., the new Isotronic method is the most *practical* ever devised! For conclusive proof, write for details and FREE SAMPLE LESSON. Use it on your own set or a friend's—repair it—convince yourself you can make *big money immediately* in your own TV business! Hurry—Free Lesson supply limited. Write

Electronic Engineering Co., Dept. B-182, 1038 So. La Brea, Los Angeles 19, Calif



NO LAYOFFS
for men skilled in . . .
DRAFTING!

LEARN AT HOME . . . QUICKLY . . . IN YOUR *SPARE TIME!*

Job security, rapid advancement, big pay checks are only a few of the many benefits enjoyed by men with a C.E.I. diploma.

The opportunities available to well-trained draftsmen were never greater! The President is deeply concerned about the shortage of technically trained men such as draftsmen. The need for skilled draftsmen is tremendous and is growing daily. This vital shortage has existed for 15 years and will continue for at least 20 more years. Never before has such a golden opportunity been offered to men like YOU!

Drafting is the only field which makes it possible for you to obtain easily, without any special background or experience, a professional, well paying, secure, important future. C.E.I.'s staff of licensed professional engineers show you how to gain this goal in only a few short months of spare time study!

What a Cleveland Engineering Institute diploma has done for thousands of others, it can do for YOU, too! Write for full information today!

★ **VETERAN APPROVED**

YOUR CHOICE OF EASY, LOW PAYMENT PLANS. NO CARRYING CHARGES!

PROFESSIONAL EQUIPMENT AND SUPPLIES FREE OF EXTRA COST!

You, Too, Can Have
MORE MONEY • PROFESSIONAL RATING • SECURE FUTURE

Strikes and layoffs are nightmares of the past. C.E.I. training opened the door to a wonderful future for me and my family.
H. Oeftering, Ohio

C.E.I.'s course has helped in many ways; raised my education rating, technical rating and income.
J. F. Balschun, Canal Zone

My C.E.I. training has advanced me from a job as a laborer to a position as Jr. Engineer with big pay increase.
J. Morgan, California

There is tremendous personal satisfaction on finding yourself in demand because you are a skilled professional I recommend C.E.I.'s course to anyone interested in financial betterment.
Anthony J. Miller, Penn.

FREE LESSON and SUCCESS BOOK

MAIL COUPON NOW!

CLEVELAND ENGINEERING INST., Dept. PS-2H
6300 Euclid Ave. Cleveland 3, Ohio
Please RUSH my Free Success Book and Lesson
☐ Aeronautical ☐ Mechanical
NAME .....
ADDRESS .....
CITY ..... STATE .....
No Obligation — No Salesmen

CLEVELAND ENGINEERING INSTITUTE
ENGINEERING DRAFTING EXCLUSIVELY

"TOOK IN $217 FIRST 10 DAYS"

Some make more, some less...

We help you to start Your Own All-Year Business

Make Big Money! With our easily operated, highly efficient wall washer, Charles Stelle took in $217 gross in first ten days. E. L. Goss took in more than $10,000 in one year. E. C. Taber wrote, "*I made $400 gross in two weeks.*" And no wonder... this machine washes walls 6 times faster and better than by hand.

Your Money-making Opportunity. We want more men to go into this profitable business for themselves and enjoy independence—freedom from bosses, layoffs. Customers everywhere—homes, offices, schools, churches, hotels, etc. How much you earn depends largely on *you*. What you take in is mostly profit. No need to rent shop or office; operate business from home. Can start spare time until your full time is available.

Lose no time. Get all facts without obligation

FREE BOOK! MAIL COUPON TODAY!

VON SCHRADER MFG. CO.
211 "W" Pl., Racine, Wisconsin

Send at once (no obligation) your **FREE** booklet containing information about your WALL WASHING MACHINE and how I can start my own permanent, profitable business.

Name_____

Address_____

City_____ Zone_____ State_____

KEEP YOUR... on BENJAMIN for HIGH H[illegible]C COMP

"First in POWER and ACCURACY"

AIR GUNS & CO_2 GAS GUNS—Top Quality at LOWEST PRICES!

Benjamin Super CO_2 Rocket Gas Pistol with 2-Stage HI-LO Jet Power as low as $13.95

BB or 177 or 22

All Models Benjamin CO_2 Carbine Gas Rifles and Benjamin CO_2 Rocket Gas Pistols Use Standard Size CO_2 (Soda) Cartridges (available everywhere). 2-Stage HI-LO Jet Power—**High** for Small Game—**Low** for Target—Up to **50 Shots** from Each Cartridge. **No Pumping—Accurate—Safe—Economical—Non-Toxic**—12 Models BB or 177 or 22.

Benjamin Air Rifles and Benjamin Air Pistols are Recognized All Over the World for Finest Workmanship and Highest Quality at Lowest Prices. Adjustable Power with Amazing Optimum Force. **Fully Guaranteed—Accurate—Safe—Economical.** Easy to Use Anywhere—12 Models for Target and Small Game 22 or 177 or BB from $18.50.

FREE! Catalog All Models Benjamin Air Guns & CO_2 Guns & Supplies. Also, Money-Saving Offer on Hunting & Fishing Knives, Accessories, etc.

Send Gun Catalog and Special Knife Offer!

BENJAMIN AIR RIFLE CO. **MAIL TODAY!**
852 BARRY ST., ST. LOUIS 4, MO., U.S.A.

Name_____

Address_____

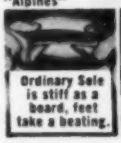
City_____ State_____

EMPLOYED MEN! Make up to $40.00 EXTRA a week!

Full Leather Lined Double Air Cushioned "Alpines"

SELL FRIENDS NEW WORK, DRESS & CASUAL SHOES IN SPARE TIME

Demonstrate new patented Air Cushion comfort. *Simple 2-finger demonstration makes shoe selling a snap.* Exclusive "Trade-In" Offer gives customers cash for old shoes. Advance commissions to $5.00 a pair. Cash bonus. No investment required. Samples supplied. Write NOW for FREE Outfit. CHARLES CHESTER SHOE CO., Dept. B-5819, Brockton, Mass.



Ordinary Sole is stiff as a board, feet take a beating.

Chester Air Cushion Sole: soft, comfortable, flexible.

RUPTURED

BE *FREE* FROM TRUSS SLAVERY

Now there is a new modern **Non-Surgical** treatment designed to permanently correct rupture. These **Non-Surgical** treatments are so certain, that a Lifetime Certificate of Assurance is given.

Write today for our New FREE Book that gives facts that may save you painful and expensive surgery, and tells how non-surgically you may again work, live, play and love and enjoy life in the manner you desire. There is no obligation.

Excelsior Hernia Clinic, Dept. 3705, Excelsior Spgs., Mo.

Find HIDDEN TREASURES

GOLD, SILVER, PRECIOUS METALS with the Famous Model 27 Metal Detector. Lightweight, ultra-sensitive, low cost. None finer. Also GEIGER COUNTERS for uranium and the VIOLITE for tungsten. INFORMATION FREE

THE *Detectron* CORP.
5528 Vineland Ave., No. Hollywood, Calif.

STUDY TO BE A DOCTOR

of Psychology or Metaphysics

Obtain a Ps.D., Ms.D., or Ph.D. Be a Teacher, Lecturer or Accredited Practitioner. Teach others how to achieve Health, Happiness and Contentment. Chartered by State. Correspondence courses only. Write for FREE book telling how.

THE NEOTARIAN FELLOWSHIP

Desk 5, Pickwick Building Kansas City 6, Missouri

---

24 YEARS AT THIS ADDRESS

"We Have No Rent to Pay." That is Why We Can Sell for Less

Written Guarantee Sent. SEND AD

EVERYBODY MAY DEDUCT **10% off** ON EVERY TIRE

Free—Tube With Each Passenger Tire

One of the oldest distributors of slightly used tires in America.

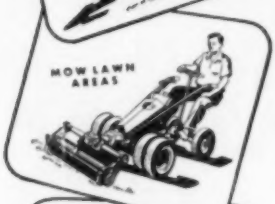
FREE If you buy 2 or more Passenger 4-ply tires, WE GIVE ONE tire FREE, on each order. Does not include W.W. or Truck Tires. Send Ad.

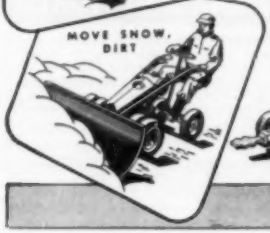
WHITE WALLS	$1.00 EXTRA—12 MOS. WRITTEN GUARANTEE						
600-16	5.15	640-15	$4.95	700-15(6)	$8.75	700-20	$11.95
600-16(6)	6.45	670-15	5.25	750-16(8)	10.25	750-20(8)	10.95
650-16	5.45	710-15	5.35	700-17	10.85	825-20	18.55
650-16(6)	6.45	760-15	5.45	750-17	12.75	900-20	18.75
700-16	6.25	800-15	5.75	650-20	10.75	1000-20	17.95
750-16(6)	7.45	820-15	5.75	32x6(8)	10.35	1100-20	17.95
650-15	5.75	700-16(6)	7.75	750x14	12.05	1000-22	20.95

"EXTRA SPECIAL" Fully Guaranteed all size 4-ply pass. FREE TIRE with 2 or more of these.—W. W. $1.00 Extra. Factory Tested Tube given. GIANT TIRE SALE. **$8.75**

Thousands of tires shipped all over the U.S.A. All tires shipped F.O.B. Phila. Send Check or M.O. with this ad. Dept. S. No C.O.D.

STANDARD 834 N. Broad St., Philadelphia 30, Pa.



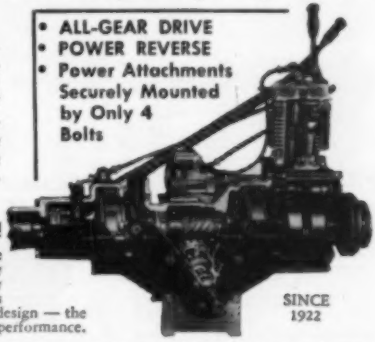


GRAVELY MAKES TOUGH JOBS EASY!

Gravely does jobs other tractors won't . . . because Gravely has that *extra* power you need for the toughest lawn, garden, field and farm tasks. Does a better job everywhere, even on *steep slopes!*

With a choice of 30 attachments, you do every chore with a performance-proved tool that does it *better, faster, easier!* Because Gravely's *all muscle*— its direct engine drive puts the power where it counts— at the *working tool.* That means performance *Plus!*

- **ALL-GEAR DRIVE**
- **POWER REVERSE**
- **Power Attachments Securely Mounted by Only 4 Bolts**



SINCE 1922

More For Your Money!

Yes, you get more power, more performance, more for your money when you get Gravely. The cutaway view on the right shows you its clean, compact, power-engineered design — the reason for Gravely's remarkable performance.

Never before, in a small tractor, such remarkable *versatility,* such built-in *power.* Whatever the job, whatever the season, Gravely turns in a *real* job with unbelievable *ease* and *speed* . . . All-Gear Drive, Power Reverse, Balanced-Weight Handling, Push-Button Starter optional.

FREE

New 24-page *"Power vs Drudgery"* Booklet shows how Gravely can solve *your* upkeep and gardening problems *better, faster, easier.* Mail coupon today!

EASY PAY PLAN

WRITE TODAY

GRAVELY TRACTORS, INC.
BOX 284 DUNBAR, W. VA.

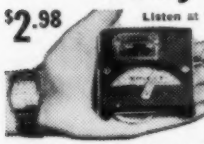
Please send me "Power vs. Drudgery" Booklet and dealer's name.

Name_____
Address_____
City_____ Zone____ State____

FIELD-TESTED SINCE 1922

New! Tiny Pocket Size Radio

$2.98



Listen at work, play, in bed. Fits shirt pocket. No tubes. No batteries. No electric plug-ins. No expense. Plays day & night forever. New self-powered diode rectifier replaces tubes. Uses short aerial for local stations. Tuner covers complete broadcast band. Red plastic case only 3x3½x1½ inches. Lifetime guarantee. Radio (without phone) $2.98. Hearing Aid Phone (plugs in ear, flesh-colored, almost invisible $1.98. Regular phone $1.25

JOHNSON SMITH & COMPANY, Dept. 637, Detroit 7, Mich.

10-FOOT BULL WHIP

HARD HITTING! LOUD CRACKING! Experts knock ashes off cigarets. Yank people off feet. Used by trainers, ranchmen. Loud cracker like a shot-gun blast. 4-ply hand plaited all leather. With handle loop.

6-ft. whip $1.98. 8-ft. $2.69. 10-ft. $3.29

JOHNSON SMITH COMPANY Dept. 637 Detroit 7, Mich.

Pellet Shooting Automatic

Shoots 10 pellets as fast as you pull trigger. For indoor target work & fun. Automatic action. Holds 10 pellets. Full size model of Colt .45. 6½-in. long. Plastic moulded. Moving parts of die cast metal. With supply of pellets. (Ex-tra Pellets, 25c Pkg. Holster 50c) EACH..... $1.65

Johnson Smith & Company, Dept. 637, Detroit 7, Mich.

Catalog OF 3200 Novelties 10c

Send 10c for amazing catalog of novelties, live animals, scientific supplies, hobbies, funmakers, planes & boats, looms, magic tricks, joke articles, unusual seeds, gadget timesavers, cameras, optical goods, projectors, movies, lucky jewelry, religious novelties, disguises, musical instruments, stamps, coins, puzzles, fortune tellers, radios, auto & bike accessories, telescopes, magnifiers, compasses, banks, smokers' gadgets, artists' supplies, printing sets, engines, motors, shockers, knives, billfolds, fireworks, guns, rifles, sports, books, games, plants, etc. Send name, address & 10c to:

JOHNSON SMITH & CO., Dept. 637 Detroit 7, Michigan

99¢

10-in. Balanced Throwing Knife Hunt small game. Target work, regular use. Double-edged penetrating point. Hard hitting. Balanced for easy accurate throwing. Cutlery steel. Only 99c (Sheath 50c, Knife Throwing Book 15c). Johnson Smith Co., Dept. 637, Detroit 7, Mich.

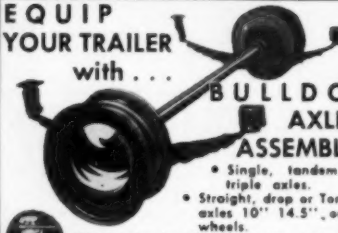
POWERFUL ELECTRIC GENERATOR

Cost Over $20.00 New! While They Last, $3.95

Generates Up To 75 Volts. Use to generate electricity to ring bells, light up lights, as a medical battery, deliver terrific electric shock as joke, many electrical experiments. Classroom uses, etc. Hand crank or gear wheel drive. Made by leading electrical companies. Each has 3 or 4 five-inch 1-lb. bar magnets (alone worth more than total cost), generating armature, wire leads, gear crank, ready for use. Originally used in crank phones. Weighs over 5 lbs. Postpaid $3.95

Johnson Smith & Co., Dept. 637, Detroit 7, Mich.

EQUIP YOUR TRAILER with . . . BULLDOG AXLE ASSEMBLIES



- Single, tandem or triple axles.
- Straight, drop or Torq-less axles 10" 14.5", or 15" wheels.

Write today for FREE descriptive folder 14B

HAMMER BLOW TOOL CO. Wausau, Wis

ACCORDION PRICES SMASHED

SAVE 50% AND MORE DURING THIS GREAT SALE

5 Days' FREE TRIAL

Hurry! Get in on these sensational accordion values. America's largest exclusive accordion dealer selling out finest brand new accordion overstock! Fabulous savings. Leading brands in more than 30 new models. Small down payment. Easy terms. Trade-ins accepted. Chance of a lifetime.

FREE for promptness . . .
- FREE Lessons
- Music Stand
- Deluxe Case
- Lifetime Guarantee

FREE COLOR CATALOG & Wholesale Prices

Learn how easily you may own and play a fine accordion. Rush name and address for big FREE Color Catalog and new low wholesale price list. No obligation. WRITE TODAY!

ACCORDION MANUFACTURERS AND WHOLESALERS OUTLET

2003 W. CHICAGO AVE., Dept. P-28, CHICAGO 22, ILLINOIS

BARBELLS

100 POUND SET $11.80

Extra Plates Only 10c Pound

140-Pound, CHROME DELUXE Barbell-Dumbbell set only $18.80. This is our feature set and is the finest ever manufactured.

Training with adjustable weight is the BEST way to keep fit; the ONLY way to develop great strength and a perfect body. As the oldest and best equipped barbell company, BUR gives value and prices no one can equal.

SEND FOR FREE CATALOG.

BUR BARBELL CO.

Lyndhurst 5, New Jersey

HYPNOTISM

Be Popular Amaze Entertain

Learn to apply Hypnotism and Autosuggestion in short time by training at home. Write to America's oldest, most famous Hypnotic School for free information—now—today. DON'T DELAY. Satisfaction or money refunded. Sent in plain wrapper.

SCHOOL OF APPLIED HYPNOLOGY

Dept. 22 120 Central Park South N. Y. 19, N. Y.

What Does Your English Say About You?

Every time you speak or write, you show what you are. Poor English can harm you more than you realize. A command of effective English helps you socially and in business. You can improve your English through Sherwin Cody's famous patented invention. If you are ever embarrassed by mistakes in grammar, spelling, pronunciation or punctuation, send for Mr. Cody's free book, "How You Can Master Good English in 15 Minutes a Day." No obligation. No salesman will call. Address: Sherwin Cody Course in English, 572 Central Drive, Port Washington, N. Y.

BECOME A . . . Machine Tool DRAFTSMAN & DESIGNER

Mail Coupon For Free Brochure

Simplified home study training program. Learn every phase of Machine Drafting and Tool Designing. Step up to a better job—big-pay. Use spare hours—no interference with present work. Diploma awarded. Low Tuition.

American Technical Society
Dept. PS-258, 850 E. 58th St.
Chicago 37, Ill.

Please send me your FREE BROCHURE and full details about Machine Draftsman and Tool Designer training program.

Name.....

Address.....

City..... State.....

MASONITE
Makes the News

New "dream walls" offer the warmth of wood . . . without the work!

Misty Walnut PANELS

©Masonite Corporation—manufacturer of quality panel products

How often have *you* dreamed of the richness, the warmth of wood-grain walls? Only to find they were beyond your budget...too tricky to install...or too much work to keep up.

No more! These new *Misty Walnut* panels bring you all the rich beauty of wood—and without the high cost, either!

Your wall panels go up in handy four-foot widths ...no tedious matching or fitting. Attractive vertical grooves set off the grain, give your wall a custom-paneled look. Joints are concealed...no nails mar the surface.

Once up, your work is done. No sanding or filling. A coat of good paste wax enhances the beauty of *Misty Walnut*...no chore to keep clean.

Sound like a dream? It *is*...a dream come true... and it's at your lumber dealer's now. *Misty Walnut* by Masonite!

MASONITE
Panel Products

Masonite Corporation
Dept. PS-2, Box 777, Chicago 90, Ill.

Yes, I'd like more information on the new *Misty Walnut* panels; also "Hints to the Handyman," showing me how to work with Masonite® products.

Name .....

Address .....

City ..... *State* .....

Zone ..... *County* .....

YOU can acquire

LAW NIGHTS AT HOME! LL.B. DEGREE

LaSalle's famous Law Library—used as reference in many Law libraries and Law offices—has enabled thousands to master Law surprisingly fast, in spare hours at home, for business and professional advancement.

These 14 remarkable volumes, compiled by leading professors and lawyers, cover the whole basic field of Law in condensed, orderly, simplified manner.

You advance rapidly with this great library, plus special lectures furnished. We guide you step-by-step with personalized Problem Method of instruction . . . you *learn by doing*—handling legal problems—not by memorizing rules.

Send for two FREE booklets, "Law Training for Leadership," and "Evidence," answering questions about Law and its value to you, and telling how LaSalle Law graduates are winning rapid advancement in business and public life. Mail coupon below. No obligation.

LA SALLE EXTENSION UNIVERSITY
A Correspondence Institution
417 S. Dearborn St. Dept. 283L Chicago 5, Ill.

Send me your two FREE booklets described above, without obligation.

Name.....*Age*.....

Street.....

City, Zone & State.....

EARN $100 A WEEK AND UP

BE AN AUTO-DIESEL MECHANIC...EARN WHILE YOU LEARN

Many of our graduates earn $100 a week and up. You learn fast in our school and shops because you learn with tools on real equipment. Experienced instructors explain WHY and show you HOW, then you DO IT YOURSELF. One of the best equipped technical schools in the United States. Thirty-nine years' experience training men. Successful graduates in 48 states and many foreign countries. Approved for veterans. Day and evening classes. Free bulletin—write today.

NASHVILLE AUTO-DIESEL COLLEGE
226 7th Ave. N., Dept. 42 Nashville, Tenn.

Tells How You Can Learn to MOUNT BIRDS!

FREE BOOK

Learn At Home

Men, Boys, Hunters, Fishermen, mount and save your lovely wild-game trophies. Be a Taxidermist. Mount Birds, Animals, Heads, Fish, Ten skins. YOU learn easily, quickly in spare time. Have a grand home-museum. The finest and the greatest hobby known, for sportsmen. Fun, real profits.

FREE BOOK Yes, FREE. Beautiful strange, valuable Book, telling all about Taxidermy. Contains over 100 beautiful game-pictures. And it's yours FREE, if you rush your request. You can mount all kinds of wild-game, and common specimens too. We can positively TEACH YOU. So GRASP this opportunity. RUSH letter or postal for this amazing FREE BOOK. Don't delay. State your AGE.

N. W. SCHOOL OF TAXIDERMY, 2602 Elwood Bldg., Omaha 2, Neb.

RUPTURED? Write for Relief FACTS FREE!

ENJOY NEW FREEDOM

of action, peace of mind and comfort at work or play. Proven, patented MILLER holds your rupture back Day and Night—will bring you lasting relief! Has helped thousands of others!

For FREE facts in plain wrapper—Send Name and Address to

FRED B. MILLER, DEPT. 1-8
Manufacturer, HAGERSTOWN, MARYLAND

REAL ESTATE BE A BROKER

PAYS BIG! SEND FOR FREE, BIG, ILLUSTRATED CATALOG NOW! Graduates report making substantial incomes. Start and run your own business quickly. Men, women of all ages, learn easily. Course covers Sales, Property Management, Appraising, Loans, Mortgages, and related subjects. STUDY AT HOME or in classrooms in leading cities. Diplomas awarded. Write TODAY for free book! No obligation.

FREE BOOK TELLS HOW

Approved for World War II and Korean Veterans

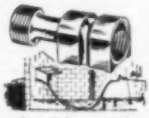
WEAVER SCHOOL OF REAL ESTATE (Est. 1936)
3020S Grand Ave. Kansas City, Mo.

Coast to coast, high-paying jobs in photography are waiting for people with that "know-how" to fill them. You can quickly, easily qualify at home with the world-famous NYI Learn-by-Doing Method. Write today for free catalog. Also resident training in N.Y. 48th Year. Approved for Vets.

NEW YORK INSTITUTE OF PHOTOGRAPHY
Dept. 5 10 West 33 St., New York 1, N. Y.

PUMPS 300 GALS. PER HOUR

Needs No Electric Motor or Gas Engine Power. Lifts Water 6 Ft.



When water gets into your cellar, or you want to drain out a pool, vat, cistern, excavation, boat, don't break your back hand-pumping or bailing. Just connect your garden hose to nearby water faucet and free end to intake side of SPEEDY DRAINER. Connect another length of hose to discharge side, turn on faucet, and SPEEDY DRAINER will pump out water at the rate of 300 gallons per hour, right down to the bottom. This precision-made, all brass, siphon pump has no moving parts to wear, jam or rust. It's priceless when you need it, yet costs only $2.98 postpaid. Plus postal charges if C.O.D. MONEY BACK GUARANTEE.

MERIDIAN CO., 306 Madison Ave., Dept. D-182, New York 17

"THIS WISDOM MUST DIE!"

Truths That Have Been Denied Struggling Humanity

FOR every word that has left the lips of bishops or statesmen to enlighten man, a thousand have been withheld. For every book publicly exposed to the inquiring mind, one hundred more have been suppressed — *damned to oblivion.* Each year of progress has been wilfully delayed centuries. Wisdom has had to filter through biased, secret sessions or ecclesiastical council meetings, where high dignitaries of state and church alone proclaimed what man should know.

Are you prepared to demand the hidden facts of life? Will you continue to believe that you are not capable of weighing the worth of knowledge that concerns your personal freedom and happiness? Realize that much that can make your life more *understandable* and *livable* has been left unexplained or intentionally destroyed. At first by word of mouth only, and *now* by private discourses, are *revealed* those truths which secret brotherhoods preserved in ancient temples and hidden sanctuaries, from those who sought to selfishly deprive humanity of them.

THIS *free* BOOK OF EXPLANATION

Let the Rosicrucians, one of these ancient brotherhoods of learning, tell you about these amazing truths, and explain how you, too, like thousands of others, may now use them to enjoy the fullness of life. The Rosicrucians, (not a religious organization) invite you to send today for your Free copy of "The Mastery of Life" with its startling tale of *self help.* Use the coupon opposite or address: Scribe L.O.Y.

The ROSICRUCIANS (AMORC)
SAN JOSE, CALIFORNIA, U. S. A.

Scribe L.O.Y.
THE ROSICRUCIANS (AMORC)
Rosicrucian Park, San Jose, California, U. S. A.

Please send me your FREE Book. I am sincerely interested in learning how I may receive these long-concealed facts of life.

Name _____

Address _____

DRAFTSMEN

CASH BIG PAY CHECKS!

Train Now for more success, greater security

LEARN AT HOME IN SPARE TIME
(or at college in Chicago)

Check the want ads in any newspaper—SEE the big-pay opportunities open to you as a draftsman. What's more, you can learn this well-paid, prestige profession at home—quickly, easily! No special talent needed! Get complete, step-by-step Chicago Tech lessons in the mail, spend a few pleasant hours studying each week. In a short time you'll be a well-trained draftsman, ready to take your pick of many good jobs. Act now!

FREE INFORMATION—MAIL COUPON TODAY!
Get FREE TRIAL LESSON plus information about C.T.C. practical training. Learn what successful Chicago Tech graduates say about high pay and opportunities in drafting. No charge, or obligation.

CHICAGO TECHNICAL COLLEGE

B-226 Tech Bldg., 2000 So. Michigan Ave.
Chicago 16, Illinois
Mail me FREE Lesson with information about big opportunities in DRAFTING.

Name .....Age.....

Address.....

City.....Zone....State.....

U-MAK-IT BOAT KITS

NEW
LAPSTRAKE SKIFF KITS
Now added to our great line of kits, new easy to assemble Lapstrake Skiffs.

30 years of boat kit pioneering. 30 models. Prams, Rowboats, Outboards, Cabin Cruisers and Skiffs.

SEND FOR ILLUS. CATALOG
Showing all models from 8' to 23'. Const. details, paints, access., etc. All you need to build your own.
MAIL 35c (coin) for Postage & Handling.

U-MAK-IT *products*
DELAND, FLORIDA, DEPT. 11

MODERN IMPROVED LAWN MOWER SHARPENER AND BED KNIFE GRINDER

Sharpen any mower in 10 to 20 minutes. Hand—Power—Reel or Rotary. Modern is actually two machines in one: a Precision Bed Knife Sharpener and a Precision Reel Sharpener. Extra Bed Knife Grinder is Absolutely Unnecessary. New Mower Support makes it possible to sharpen reel without removing bed knife. The fastest precision lawn mower sharpener on the market. Costs Less. Compare Modern's Many Exclusive Features Before Buying. Send for Free Brochure No. 11 SN

MODERN MANUFACTURING CO.
160 North Fair Oaks Ave., Pasadena, California

Print Your Own

Cards, Stationery, Advertising, Circulars, labels, photo and movie titles, church work, tags, etc. Save money. Sold direct from factory only. Raised printing like engraving, too.

Own a Printing Business
Print for Others. Good Profit. Have home shop. Junior press $15; Senior $29 up. We supply everything. Easy rules. Pays for self in short time. Write for free catalog of outfits and all details.

KELSEY PRESSES, C-33 Meriden, Conn.

EXCLUSIVE DOUBLE-BEARING
HEAVY DUTY PUMPS

IRRIGATE • DRAIN • CIRCULATE • SPRAY
Up to 7,500 GPH; 1,000 GPH 60' high; or 3,000 GPH from 25' well. Use ¼ to 1 HP motor. 1¼" inlet; 1" outlet. Stainless shaft. **TYPE X**—2 oil-less bronze bearings. Won't rust..... **$10.95**
TYPE XB—Ball bearing model. Best for belt drives..... **$12.95**
Postpaid if cash with order.
Don't delay—send for yours today!
MONEY BACK GUARANTEE
Centrifugal and Gear Pumps in All Sizes
LABAWCO PUMPS, Belle Mead 4, N. J.

EXTRA MONEY PART TIME!

SELL FAMOUS DOUBLEWEAR SHOES TO FRIENDS, NEIGHBORS, CO-WORKERS!

Full line dress, sport, work shoes for men. Priced for fast sales—you collect BIG COMMISSIONS on the spot! Sell evenings, lunch hour, etc. **Up to $25 an evening SPARE TIME!** Sell for oldest firm in field—since 1908.

FREE!
Big 1958 Catalog, all details of special SPARE-TIME PROFIT PLAN!

DOUBLEWEAR SHOE CO.
315 E. Lake Dept. 36 Minneapolis 8, Minn.

2 FOR $14.95
MAGNETO HANDSET INTER-COMM

(rebuilt). For house to barn etc., included 100 ft. of wire and 4 batteries. Additional wire .01c per ft. Any number can be connected in same line. Write for FREE List. All Shipments FOB Simpson, Pa.

TELEPHONE ENGINEERING CO.
Dept. 2A8 Simpson, Pa.

FREE!
CHEMISTRY

Wouldn't you like to enroll for a complete course in Chemistry, earn a valuable Diploma, *and not pay a cent for the whole thing!* Then don't delay; send today for free catalog describing 18 fascinating Chemistry courses, laboratory equipment and instruments, all of which may be yours without cost if eligible! **FREE** chemical tester if you answer now! **NATIONAL SCHOOL OF CHEMISTRY, Redwood City, Calif.**

WE DON'T NEED ENGINEERS

. . . but they write to us daily to order our GENIAC® Electric Brain Construction Kits.

So do TEACHERS, SCIENTIFIC AMATEURS, INDUSTRIAL FIRMS and schools. (See list below.)

THOUSANDS OF SATISFIED CUSTOMERS have bought GENIACS on a 7 DAY REFUND guarantee

We are proud to offer our 1958 Model, with up to the minute improvements for the thousands of new customers who can use them.

WHAT IS A GENIAC?

Here is a picture of the 1958 Model GENIAC in the display rack ($3.00 separately) which comes with every kit.

GENIAC stands for *Genius Semi-Automatic Computer*. A kit of specially designed switch decks and racks which permit the user to construct more than thirty different machines (following directions and wiring diagrams) and as many more as he is able to design himself. These machines demonstrate the applications of electric circuitry.

APPLICATIONS OF GENIAC®

SIMPLE COMPUTER CIRCUITS for binary, decimal adding, subtracting, dividing, multiplying machines, PROBLEMS in symbolic logic, reasoning, comparing, PSYCHOLOGICAL TESTING and EXPERIMENT GAME PLAYING CIRCUITS for tit-tat-toe and nim. ACTUARIAL ANALYSIS.

SOME OF OUR CUSTOMERS

Allis-Chalmers • Remington-Rand • International Business Machines • Manuel Missionary College • Barnard College • Westinghouse Electric • Phillips Laboratories • General Insurance Co. of America • Lafayette Radio • Roar Aircraft Co. • Albert Einstein Medical College • Naval Research Laboratories • Board of Education, Tecumseh, Nebraska • Los Angeles Public Schools • Jefferson Union High School • Oklahoma A & M • Courtland Jr. High School • Bell Telephone Laboratories.

WHAT COMES WITH THE KIT?

BOOKS—1. SIMPLE ELECTRIC BRAINS, AND HOW TO MAKE THEM . . . 64 page experiment manual.—NEW! 2. MINDS AND MACHINES . . . 100 page text on computers, automation and cybernetics.—NEW! 3. WIRING DIAGRAMS for basic GENIAC circuits.—NEW! 4. Beginners Manual for the person who has little or no familiarity with electric circuits.—NEW! 5. GENIAC study guide . . . the equivalent of a full course in computer fundamentals. Lists additional readings.

PARTS—PANELS, DISCS, RACK (for easy assembly and display). Hardware, wire, tools, battery, holder etc. for more than thirty machines.

SEND for your GENIAC now. At only $19.95, a bargain, comes complete with over 400 parts and components, 5 books and manuals. We guarantee that if you do not want to keep GENIAC after one week you can return it for full refund.

Add 50c west of Miss. $2 outside U.S. Mail Name & Address with check or Money Order to

OLIVER GARFIELD CO., Inc. Dept. PS-28 126 LEXINGTON AVE. NEW YORK 16, N.Y.

---

not everyone does as well, but E. O. Lockin, who started a business of his own, reports . . .

for 12 months I've averaged $800 PER MONTH INCOME — *most of it clear profit for me!*

● Many men have discovered how to be independent, to be free of bosses and layoffs. L. A. Eagles grossed more than $200 his first week. Others report gross up to $12,000 per year. How much you make depends largely on *you*. You need no special skill, no large investment.

No shop necessary. Our ELECTRIC RUG WASHER cleans rugs, carpets right on floor . . . helps to show their natural color, beauty. So efficient and safe, used by largest hotels and railroads.

You take no risk. Machines fully guaranteed. Write for full information including how to make big profits in YOUR OWN business.

MAIL COUPON TODAY FOR FREE BOOK

VON SCHRADER MFG. CO., 211 "R" Pl, Racine, Wis.

Without obligation, send your **FREE** booklet containing information about your ELECTRIC RUG WASHER and how I can start *my own* permanent, profitable business.

Name_____

Address_____

City_____ Zone____ State_____

CHECK NOW . . . CUT ON DOTTED LINE . . . MAIL TODAY

Special Opportunity Check-List

TEN MOST-WANTED MEN

The ten Engineering Technician classifications listed below are those which currently offer you the greatest opportunity with a minimum of special training.

Find out how you can qualify for one of these interesting, vital, high-pay jobs. The I.C.S. method makes it possible to prepare yourself while holding down your present job and supporting a family.

For full details at no cost or obligation, tear out this check-list, mark the opportunity that interests you, and mail it to International Correspondence Schools, Scranton 15, Penna.

- ☐ Aero-Engineering Technician
- ☐ Chemical Lab. Technician
- ☐ Electrical Engineering Technician
- ☐ General Electronics Technician
- ☐ Industrial Electronics Technician
- ☐ Aircraft Draftsman
- ☐ Electrical Draftsman
- ☐ Mechanical Draftsman
- ☐ Petroleum Engineering Technician
- ☐ Radio-TV Technician

*Your name*_____ *Age*____

*Home address*_____

*City*_____ *Zone*____ *State*_____

*Present occupation*_____

*Working hours*_____ *A.M. to*_____ *P.M.*

Mail to:
INTERNATIONAL CORRESPONDENCE SCHOOLS
Box 55314B, Scranton 15, Penna.

GOOD GARDENING MADE EASY

Famous Mustang Tillers build soil in nature's own way, give you all the power you need to make good gardening easy. Rugged and dependable, three Mustang models have Bolens Select-O-Width extension tines that let you vary your tilling swath from 16 to 40 inches. Year-'round attachments also available.

BOLENS

mustang tillers

BOLENS PRODUCTS DIVISION
Food Machinery & Chemical Corp.
Port Washington 6E, Wisconsin

SEND FOR CATALOG

You can make money in

WATCH REPAIR

Learn at home the low cost Sweazey Way

Watch repairing pays up to $6 an hour, part time watch makers report on survey. Unique and modern Sweazey home study System starts you making repairs right away on Swiss and American watches. Professionally prepared training. No previous experience needed. Special tools provided for practice. Tuition only $5 a month. Free sample lesson and opportunity book give all facts. Write today. No obligation.

CHICAGO SCHOOL OF WATCHMAKING
2330 N. Milwaukee Ave. Dept. 428 Chicago 47, Illinois

FREE BOOK and SAMPLE LESSON

CHICAGO SCHOOL OF WATCHMAKING
2330 N. Milwaukee Ave., Dept. 428, Chicago 47, Illinois

Please rush FREE BOOK and Sample Home Study Lesson.

Name..... Age.....

Address.....

City..... Zone.... State.....

BE A COMMERCIAL *Artist*

Prepare for a fascinating, profitable Art career this easy, proven way. One "low-cost" teach yourself course covers Illustrating, Cartooning, Lettering, Oil Painting, TV Art, etc. Plus TWO ARTIST OUTFITS at no extra cost. Cash in on demand for trained artists. Be your own boss or high pay staff artist. FREE BOOK describes our easy method, opportunities in art. No obligation. No salesman will call. Just send your name, address to: **WASHINGTON SCHOOL OF ART, Studio 151, Port Washington, N. Y.** *(Estab. 1914.)*

GET INTO ELECTRONICS

V.T.I. training leads to success as technicians, field engineers, specialists in communications, guided missiles, computers, radar, automation. Basic & advanced courses in theory & laboratory. Assoc. degree in 29 mos. B.S. obtainable. ECPD accredited. G.I. approved. Graduates with major companies. Start Sept., Feb. Dorms, campus. H.S. graduate or equivalent. Catalog.

VALPARAISO TECHNICAL INSTITUTE
DEPT. PE **VALPARAISO, INDIANA**

FREE-U.S. STAMPS

U. S. 1943 Bi-Colored Flag of Occupied Nations (as illustrated) Airmails, Commemoratives, Regular Issues, included in this collection of 25 selected, all different, genuine U.S. stamps. PLUS VALUABLE U. S. $5.00 STAMP. Everything for 10c to cover mailing expenses. Approvals included. Act at once.

WILLETT CO., P.O. Box 338, Dept. 606, Yorktown Heights, N. Y.

BUY IT WHOLESALE!

SAVE 30-80% FOR SELF OR RESELL FOR BIG PROFITS! NAME BRAND APPLIANCES, TOOLS, WATCHES, CAMERAS, PHONOS, SEWING MACHINES, JEWELRY, HOUSEWARES, SPORTING GOODS, TYPEWRITERS, ETC.

GET OUR BIG WHOLESALE CATALOG OF OVER 2,000 PROFIT MAKING ITEMS! POSTCARD BRINGS DETAILS FREE! MAIL TODAY!

Consolidated DISTRIBUTORS CLIFTON 4, N. J.

MONEY... IN HIDDEN TREASURES

Find it...with a GOLDAK Treasure Finder. Send for FREE literature on complete line of mineral & metal locaters, underwater detectors, etc., priced as low as $64.50.

In celebration of its 25th year, GOLDAK CO. introduces new transistor instruments for greater sensitivity — less weight — low cost flashlight batteries. Write for information today!

GOLDAK CO. 1544-2 GLENOAKS BLVD. GLENDALE, CALIF.

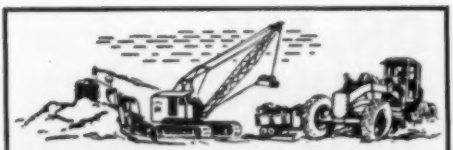
ELECTRONIC AND AERONAUTICAL ENGINEERING TECHNOLOGY

★ TWO YEAR COURSES ★

Northrop Institute in Southern California prepares you for highly paid positions in Aviation and Electronic Industries. Employment assistance during school and after graduation. Approved for Veterans.

Write today for FREE CATALOG

NORTHROP AERONAUTICAL INSTITUTE
1157 W. Arbor Vitae • Inglewood 1, California



HIGH WAGES!

Make big pay in the construction industry as an operator of Bulldozers, Draglines, Shovels, Back Hoes, Scrapers and Motor Graders. Learn these skills NOW! Machines of major manufacturers are used in our training program. Contractors need operators of earthmoving machines and pay high wages to our graduates. Don't be satisfied with just a job . . . learn a career!

VETERANS: Ask about G.I. Benefits

Write TODAY for FREE School Catalog,
no obligation, to either address

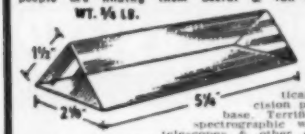
National School of Heavy Equipment Operation
P. O. Box 8243, Dept. A-7
Charlotte, N. C.

Western National School of Heavy Equipment Operation
P.O. Box 527, Dept. A-7
Weiser, Idaho

WE DON'T KNOW

all the many uses for these prisms but we do know 1000's of people are finding them useful & fun — how about you?

WT. ⅛ LB.



PRISMS $1.50

Made for U.S. Govt. for tank periscopes. Fine optically ground, big precision prisms with silvered base. Terrific for all types of spectrographic work, in homemade telescopes & other optical systems for bending rays. Makes unusual paper weight (paint your name on it) or conversation piece for mantel. You'll find many other uses. NEW, PERFECT! Cost U. S. Govt. $25 ea. **Now $1.50 ea. ppd.** or **4 for $5.00 ppd.** Calif. res. add sales tax.

VOLUME SALES CO. **WAR ASSETS DIV., 3930 Sunset Blvd., Dept. PS-258 LOS ANGELES 29, CALIF.**

Are Those Crusts and Scales

PSORIASIS?

If they are, use Siroil. For 25 years psoriasis sufferers have learned that Siroil tends to remove those unsightly crusts and scales. If lesions recur, light applications of Siroil help control them. Siroil won't stain clothing or bed linens. Offered on 2-weeks-satisfaction-or-money-refunded basis.

Write for NEW FREE BOOKLET written by REGISTERED PHYSICIAN

NEW BOOKLET answers 30 most-asked questions about psoriasis.

SIROIL

AT ALL DRUG STORES

SIROIL LABORATORIES, INC.
Dept. PS-28 Santa Monica, Calif.
Please send me your new **FREE** booklet on PSORIASIS.
NAME _____
ADDRESS _____ Please Print
CITY _____ STATE _____

Complete Training

. . . AT ONLY A FRACTION OF THE PRICE YOU MIGHT EXPECT TO PAY

Only $10.95
for the complete 2-volume home training course (or buy books separately if you prefer)

LEARN ELECTRIC MOTOR REPAIR (INCLUDING COMPLETE REWINDING)

Train for good pay in this uncrowded field! Learn at home to service and rewind practically any electric motor—from home appliance motors to big industrial motors and generators and their control equipment. This 560-page ELECTRIC MOTOR REPAIR guide explains every step by text and ALSO by more than 900 how-to-do-it pictures.

Quick guides show how to handle specific jobs. When a certain motor comes for repair, just look it up. ELECTRIC MOTOR REPAIR shows you exactly what to do. Right down the line, it explains troubleshooting, repair, rewinding and other maintenance in a way you can understand even without a lot of previous electrical training. Price only $6.95 separately, but see money-saving offer in coupon. Money-back guarantee.

LEARN ELECTRIC APPLIANCE REPAIR (ANY MAKE OR MODEL)

This 370-page Rinehart ELECTRICAL APPLIANCE SERVICE MANUAL shows you how to do the toughest repair jobs as well as the easy ones—**even if you've never fixed an appliance before.** Gives specific instructions on every modern appliance. Includes refinishing methods. Handy charts help you locate troubles fast. Simple test instruments you can make yourself are explained. Tools, wiring problems and electrical principles are fully described. Gives you the "know how" you need to earn spare-time money fixing appliances—or, to build a full-time repair business. Only $5.00 separately—or see money-saving offer in coupon.

SPECIAL OFFER . . . you save $1.00!

If written in "lesson" form and sold as a course, you'd regard these two great books as a bargain at $100 or more! Together, they form a 930-page electrical repair library that makes it easy to train for this good-paying modern profession. Under this new offer, **you save $1.00 on the regular price of the two books.** And you can pay in easy installments while you use them!

EARN WHILE YOU LEARN!

Dept. PS-28, RINEHART & COMPANY, INC.
232 Madison Ave., New York 16, N. Y.

☐ **ELECTRIC MOTOR REPAIR ($6.95)** ☐ **ELECTRICAL APPLIANCE SERVICE MANUAL ($5.00)**

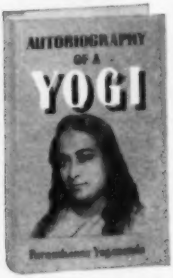
☐ **MONEY-SAVING OFFER—Save $1.00**

Send both books at special price of only $10.95 (regular price $11.95). Payable at rate $4.95 after 10 days if you decide to keep books and $3 per month for 2 months. **(SAVE! Remit price with order and we pay postage. Same 10-day return privilege with money refunded.)**

Name.....
Address.....
City, Zone, State.....

A MAN WHO FOUND GOD

AUTOBIOGRAPHY of a YOGI



by PARAMHANSA YOGANANDA

A Spiritual Classic

"These pages reveal, with incomparable strength and clarity, a fascinating life, a personality of unheard-of greatness. The author undertakes the unique task of instructing the Western reader in the practical application of yoga, setting the example in his own life... in these pages is undeniable proof that only the mental and spiritual striving of man has lasting value, and that he can conquer all material obstacles by inward strength... We must credit this important *Autobiography* with the power to bring about a spiritual revolution." SCHLESWIG-HOLSTEINISCHE TAGESPOST, *daily newspaper of Germany.*

SELF-REALIZATION FELLOWSHIP
(Dept. AP-2) Los Angeles 65, California

At All Bookstores $4.00

Millions have done it so can YOU!

Stop being SKINNY like I was

Quickly GAIN 25 LBS. of HANDSOME, POWER-PACKED MUSCLES like I did

Send for these 5 AMAZING PICTURE COURSES

All 5 FREE before $1 price goes back

1. How to GAIN MIGHTY ARMS
2. How to GAIN A BIG CHEST
3. How to GAIN A MIGHTY BACK
4. How to GAIN POWERFUL LEGS
5. How to GAIN A GRIP OF STEEL

Send 10¢ for postage for all 6 items

Also FREE Photo Book of Strong Men

Jowett Institute, Dept. PS-82, 220 Fifth Avenue, N.Y.11, N.Y.

MAKE STRIPES with new PAINT PEN

Straight, curved, single or double

With any color paint, stripe furniture, bikes, autos, model planes, toys, linoleum, wallboard. Clean, crisp decorative lines. Can't clog or smear. Also use with glue, tempera, textile paint or underglaze . . . on wood, glass plastic, ceramics, metals, fabrics and paper. Ask your dealer or order direct.

DEALERS	HOBBY	MFRS
Master paint striping tool in display carton. Write for discounts.	"Professional" results every time. Simple, easy to use. Order now.	Ask about heavy duty industrial striping tools.

DOUBLE STRIPE MODEL 5 COMBINATIONS. . . . $3.25

Single 1/16" stripe model $1.25

Other single stripe models $1.75 EA. 1/64', 1/32', 3/64', 5/64', 3/32' & 1/8'

Complete Kit (all 7 tips) $5.00

Extra tips 90c ea.

Extra 1/4' tip..$1.20

WENDELL MFG. CO. 4234 LINCOLN AVE., Dept. 238 CHICAGO 18, ILLINOIS

OH, MY ACHING BACK

Now! You can get the fast relief you need from nagging backache, headache and muscular aches and pains that often cause restless nights and miserable tired-out feelings. When these discomforts come on with over-exertion or stress and strain—you want relief—want it fast! Another disturbance may be mild bladder irritation following wrong food and drink—often setting up a restless uncomfortable feeling.

For quick relief get Doan's Pills. They work fast in 3 separate ways: 1. by speedy pain-relieving action to ease torment of nagging backache, headaches, muscular aches and pains. 2. by their soothing effect on bladder irritation. 3. by their mild diuretic action tending to increase output of the 15 miles of kidney tubes.

Find out how quickly this 3-way medicine goes to work. Enjoy a good night's sleep and the same happy relief millions have for over 60 years. Ask for new, large size and save money. Get Doan's Pills today!

Write, Draw, Decorate in Genuine 23 Kt. GOLD ON PAPER, LEATHER, PLASTIC, WOOD, METAL, GLASS, ETC.

8 FT. Gold Strip

With GOLDMARK, you can autograph wallets, books, etc. in gold. Personalize tools, sports equipment, in 23 kt. gold. Make tools, sports equipment, in 23 kt. gold. Make gold signs, decorate in gold. Thousands of uses. In Quick Dispenser.

$1

At Stationery Variety, Art, Hobby Stores or Order From: STENSO LETTERING CO. Balto. 15, Md. Dept. 209

LEARN WHILE ASLEEP!

Exciting details free!

Sleep-Learning Research Association
P.O.Box 610-F Omaha, Nebraska

NEW 12 FT. RUNABOUT $99.50 frt. inc.

Mass production economy makes for lowest price anywhere! Rugged oak frame and marine plywood construction.

FREE 1958 CATALOG

TAFT MARINE WOODCRAFT

Dept. PS-258, 636-39th Ave. N.E., Minneapolis, Minn.

GOVERNMENT OIL LEASES LOW AS $1 PER ACRE.

You do no drilling, pay no taxes, may realize a king-size profit without ever leaving home. Write for free map and literature.

AMERICAN OIL SCOUTS, Dept. PS
7321 Beverly Blvd. Los Angeles 36, Calif.

MODERN TRANSPARENT ROOF

Plates Repaired $5.00

Genuine Dupont Plastic NEW FALSE PLATE

From Your Old, Loose Plate. NO IMPRESSIONS NEEDED. New, revolutionary Duplication System actually transforms your old, loose, cracked, chipped plate into a new, natural-pink Dupont Plastic Plate with same teeth or new, natural matched teeth. ONE DAY SERVICE! SEND NO MONEY—Just your name and address for FREE details. Save at our low price. Highest prices paid for Dental Gold.

Only $18.95

30-DAY MONEY BACK TRIAL

FREE: 6 months' supply False Plate Cleaner to all who write for our money saving offer.

ALL STATE DENTAL LABORATORIES
22 W. Madison Dept. 217 Chicago 2

Colorcretors are Needed Everywhere

C-9

More Colorcretors are needed to supply growing demand for the enduring, colorful beauty possible only from Colorcrete. Time-worn concrete, stucco and other old or new masonry walls are quickly transformed into clean freshness from a selection of 30 tints, tones and shades. Cementitious base—tough, tenacious, enduring. Colorcrete is applied under pneumatic air pressure by authorized Colorcretors. Machine is easy to operate and readily mobile. Opens up opportunities for men of modest capital. Broad markets with high income potentials. Write for Opportunity Book.

COLORCRETE COLORCRETE INDUSTRIES, INC. 572 Ottawa Ave., Holland, Mich.

Better Than Your Own

SHOE STORE AT HOME

No investment, no experience needed. Just show magic cushion comfort to friends, neighbors, co-workers. Advance commissions to $4.00 a pair, plus Cash Bonus, Paid Vacation, $25.00 Reward Offer. Outstanding values for men, women, children. Money back guarantee. Shoe samples supplied without cost. Write TODAY for FREE new 84 page catalog and full details.

Two-Eyelet Hit With Cushioned Comfort

TANNERS SHOE CO., 619 BROCKTON, MASS.

ENGINEERING DEGREE IN 27 MONTHS

B.S. DEGREE IN

AERONAUTICAL, CHEMICAL, CIVIL, ELECTRICAL, MECHANICAL and ELECTRONIC ENGINEERING (Inc. Radio and TV)

Also B.S. DEGREE in 36 mo. in Mathematics, Chemistry, Physics (including Nuclear Physics), Engineering Science preparatory courses. Thorough, practical program. Individualized instruction emphasized. Government approved for G. I.'s

Keeping pace with progress in science and engineering

Spacious campus, 20 buildings; dormitories, gymnasium. Playing field. Modern, well-equipped laboratories including new physics lab and wind tunnel. Low tuition. New terms start quarterly. Enter March, June, September, December. Big demand for graduates. Students from 48 states and 40 foreign countries. Many earn a major part of their college expenses in this large industrial center. Send coupon for free catalog and full information. Enroll now!

INDIANA TECHNICAL COLLEGE

628 E. Washington Boulevard, Fort Wayne 2, Indiana

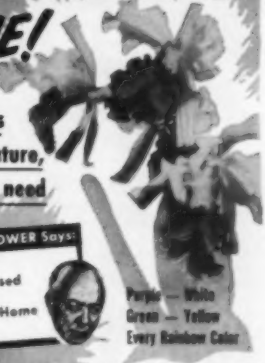
Please send me free information on *27 Mo. B.S. DEGREES* in:
Aeronautical ☐ Chemical ☐ Civil ☐ Electrical ☐
Mechanical ☐ Electronics ☐
on *36 MONTH B.S. DEGREES* in:
Mathematics ☐ Chemistry ☐ Physics ☐

Name.....

Address.....

HOW TO GROW

ORCHIDS AT HOME!



Learn about special conditions of light, temperature, humidity orchids need

SUCCESSFUL HOME GROWER Says:

"I'll Show You How Mrs. Schirmer & I Raised Orchid Plants Worth a Fortune Starting at Home in Spare Time!"

Purple — White
Green — Yellow
Every Rainbow Color

THRILLING HOBBY—Imagine the delight of watching gorgeous Orchids burst into radiant bloom – to be snipped fresh from the plant for personal corsages, for gifts, or to sell at fine profits! Big lavender or white Cattleya Orchids like those sold in every flower shop – exquisite Cymbidiums often 25 to 30 flowers on a stem. Dozens of others. Many Orchids grow without soil, getting food from the air.

PROFITABLE HOME BUSINESS—Schirmer Course explains how to market Orchids for profit, spare or full time – from small town, big city, even a farm. Big *year-round demand* from individuals, florists, hotels, etc. *Millions sold by mail order.* Learn how Orchids multiply – one plant may become many, each valuable as the first. No big investment. Takes only few minutes a day.

Hundreds of Families Growing Orchids at Home with our help . . .

"Most enjoyable hobby I know. People drove 100 miles to see this plant–10 flowers, 8½" across.
Thomas Hurst, Utah

"I sell many blooms, and haven't really started yet. Owe my success to the Schirmers."
Mrs. Frank Harwood, Ore.

"I have standing orders for future flowers. Will always be grateful to you."
Mrs. Robert E. Lee, Ohio

COMPLETE INSTRUCTIONS AND REAL ORCHID PLANT —YOURS TO EXAMINE AT HOME BEFORE YOU DECIDE!

Nearly 300 pages of Instructions – the "Know-How" *of the experts* – in simple language, jam-packed with "show-how" drawings and photographs, many in natural color. *Real blooming-size Orchid Plant* included in same shipment with Course. All for you to examine at home – *No obligation to buy a thing unless you wish. FREE* – full details. *SEND NO MONEY.* Just name & address on Coupon or post card. Write today. Airmail is quickest.

TROPICAL FLOWERLAND, Dept. 22-A
100 S. Vermont Ave., Los Angeles 4, Calif.

MAIL COUPON NOW!

TROPICAL FLOWERLAND, Dept. 22-A
100 S. Vermont Ave., Los Angeles 4, Calif.

Rush me, absolutely *FREE* and postage paid, complete details on your offer of Louis & Gladys Schirmer's Instructions which show how to grow Orchids at home. The Instructions will include a *real blooming-size Orchid Plant* and valuable "Quick Profit" Plan. All sent for me to examine at home before I make any decision whatever.

Name.....

Street.....

Town..... Zone..... State.....

Learn ELECTRIC APPLIANCE REPAIR IN YOUR SPARE TIME AT HOME

START YOUR OWN BUSINESS WITH A POTENTIAL MARKET OF 50,000,000 CUSTOMERS

ONE BUSINESS THAT IS NOT AFFECTED by STRIKES, DEPRESSIONS OR POLITICS

New shop-method, home training system gives you electrical know-how that used to take years to learn. Learn at home by building valuable testing kits, repairing your own and neighbors' appliances. It is not unusual for appliance repairmen to charge or the basis of $5.00-$6.00 an hour.

FREE ILLUSTRATED BOOK

Shows you how you learn every phase of electrical appliance. How to make money while you learn. Write today for your FREE copy.

CHRISTY TRADES SCHOOL
Dept. D-7801
4804 North Kedzie Ave., Chicago 25

FREE!

TO SECURE NAMES FOR OUR MAILING LIST

Treasure Chest OF PRIZED STAMPS FROM PIRATE STRONGHOLDS

IMAGINE! You receive FREE this whole "treasure chest" of valuable stamps from countries and islands famous in history as PIRATE hideouts! Your imagination will be carried back to the days of Jean La Fitte, Blackbeard, Captain Kidd, by these colorful stamps from the Bahamas, Barbados, Haiti, Trinidad, Liberia, Madagascar, St. Pierre and Miquelon . . . etc. You may want to sell them to envious friends. Or start a priceless "pirate country" stamp collection. ALSO FREE — Stamp Collector's MAP OF THE PIRATE WORLD and helpful, informative "How to Collect Stamps." Other interesting offers included for your inspection. Mail this ad now (with your name and address and 10¢ to help cover handling, mailing) to:

LITTLETON STAMP COMPANY,
Dept. PS-2, Littleton, N. H.

I'll Set You Up For Life In Your Own BIG PAY SHOE BUSINESS

Only 8 Orders a Day Can Make You Up to $32.00 a Day

$180.00 a week
$600.00 a month

It's no trick at all to make big money FULL OR SPARE TIME with America's most comfortable shoes. Amazing new "Spring-Step" cushion design proves it by actual demonstration. Only ORTHO-VENT has it. No other shoe in the world like it. Profits are BIG—repeat orders are sure and easy with amazing 2-minute demonstration. No experience needed. No investment to make. Everything furnished free, including finest sales outfit and actual demonstrators! Be the big-pay ORTHO-VENT man in your territory. Send Today for free outfit.

Amazing 2-MINUTE DEMONSTRATION Does Your Selling Job for You FAST!

I GIVE PRODUCERS THEIR OWN SHOES AS A BONUS!

ORTHO-VENT SHOE CO. • 482 Brand Road Salem, Virginia

FREE Details write today

MAIL ORDER Opportunity!

START FROM HOME...SPARE TIME

We want a limited number of intelligent men and women to work at home on an exclusive mail order business proposition. No selling—we furnish everything including literature, names, addresses, stock and ship items for you. All you do is mail for us and receive money coming to your own mail box. Write MAIL ORDER DISTRIBUTORS (Franchise Division)

15201 South Broadway Dept. B-2 Los Angeles 61, Calif.

PILES

If you suffer from the miseries of itching, bleeding or protruding piles, you may have a generous supply of Page's Palliative Pile Preparations *absolutely free* for the asking. They have relieved pile suffering in hundreds and thousands of cases for more than 50 years.

FREE Trial supply to quickly prove all this, will be sent absolutely free and with no obligation to buy now or later. Send name and address for free trial TODAY!

E. R. PAGE CO. Dept. 4581 Marshall, Mich.

CABINET MAKING

LOW COST HOME TRAINING COURSE FOR BEGINNERS & ADVANCED CRAFTSMEN

Make money. Learn skills and secrets of fine woodworking and tool use. Professionally prepared shop method training tells and shows how. Covers everything. Easy to master.

Write for Free Booklet

INTERSTATE TRAINING SERVICE
DEPT. F-2, PORTLAND 13, OREGON

INVENTIONS WANTED!

140 Wealthy Manufacturers Ready to Pay Top Prices

Do you have an idea for a new product or a way to improve a product already in use—patented or unpatented—you would like to sell for cash or lease on royalty? If so, send your name and address on a post card—NOW—for FREE details explaining *how* you can turn your "Big Ideas" into *big money*.

SCIENCE AND MECHANICS MAGAZINE
450 East Ohio Street • Dept. 182 • Chicago 11, Illinois

NEW RUBBER STAMP BUSINESS PAYS BEGINNERS UP TO $9.20 AN HR.

START AT HOME IN SPARE TIME with Table Top Machine!

The multi-million dollar Rubber Stamp business—once controlled by a few big companies—is now being taken over by small operators—one in each community throughout the United States. Men and Women who have this inexpensive machine can turn out huge quantities of Rubber Stamps with special wording that buyers once were forced to buy from big cities. Material costing only 27c makes a stamp that sells for $1.80. The machine that does the work is simple and easy to operate and it turns out as many as six Rubber Stamps at a time, each with different wording such as names, addresses, notices, stock numbers, prices and other "copy" needed by offices, factories and individuals. Working full capacity, it can earn as much as **$9.20 an hour for the operator!** Now you can get into the big-pay business yourself, with your own home as headquarters. You don't need experience. We supply everything, including complete instructions and eight ways to get business coming in fast. Start making up to $9.20 an hour from the very beginning. Cash in on the profitable Rubber Stamp business in your community, right away. We'll mail full particulars FREE and no salesman will call. Be first in your locality. Rush coupon today or send your name on postcard to

RUBBER STAMP DIV., Dept. R-3-B
1512 JARVIS AVENUE • CHICAGO 26, ILLINOIS

RUBBER STAMP DIV.
1512 Jarvis Ave., Dept. R-3-B
Chicago 26, Illinois

FREE!

Please rush full particulars about the little machine that can get me started in the profitable Rubber Stamp business at home in spare time. Everything you send me is FREE and no salesman will call.

NAME _____

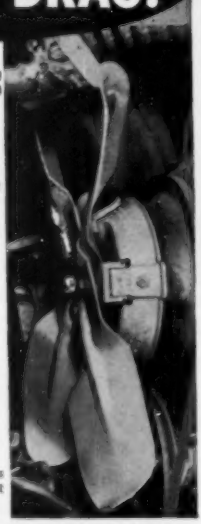
ADDRESS _____

CITY _____ ZONE ____ STATE _____

STOP FAN DRAG!

with the NEW
FAN-O-MATIC
MODEL 200
Automatic FAN RELEASE

*Makes fan a free-wheeling unit at speeds over 35 MPH**



INCREASES

- **Available Horsepower** up to 20 H.P. at cruising speeds.
- **Gas Mileage** up to 3 miles per gallon . . . by actual road tests.
- **Acceleration** up to 10% . . . in official tests conducted at Indianapolis Speedway by U. S. Auto Club.

REDUCES

- **Engine Noise, Vibration** for smoother, quieter riding.

Simple to install. Adaptable to most cars Installation instructions with every unit

**Easily adjustable to higher or lower speeds*

AVAILABLE at Auto Dealers, Garages, Service Stations
Manufactured and Guaranteed by
Radiator Specialty Co., Charlotte, N. C.
In Canada: Radiator Specialty Co., Ltd., Toronto

*2189

ENGINEERING

Photo of Heald Electrical Laboratory

Enroll Now for New Term

Heald College Ranks FIRST West of the Mississippi in "Who's Who" in America

Send for FREE Information

Heald Engineering College
Est. 1863
Van Ness at Post, Dept. P.S. 158
San Francisco, California

American Industry Steps Up Its Demand for Trained Engineers. Train Now at Healds

BACHELOR OF SCIENCE DEGREE, 27 MONTHS

Degree Courses:
- ☐ Electronic Engineering
- ☐ Electrical Engineering
- ☐ Highway Engineering
- ☐ Mechanical Engineering
- ☐ Structural Engineering
- ☐ Civil Engineering
- ☐ Architecture

Diploma Courses:
- ☐ TELEVISION ☐ Color TV
- ☐ Electronic Technician
- ☐ Industrial Electronic Tech.
- ☐ Tool & Die Design
- ☐ Architectural Drafting
- ☐ Mechanical Drafting
- ☐ Structural Drafting
- ☐ Surveying
- ☐ Estimating
- ☐ Master Electrician

Approved for Veterans

NAME _____
STREET _____
CITY _____
STATE _____

LEARN *Television*

RADIO-COLOR-TV

In the great shops of COYNE

Great opportunity for a good job or your own business in one of America's fastest growing industries! New stations . . . new sets by the millions . . . Color TV . . . all means greater opportunities.

Veterans and Non-Veterans—Get practical shop work plus technical training in TELEVISION—RADIO at Coyne in Chicago—old established school—training background nearly 60 years.

Learn on real equipment—no advanced education or previous experience needed. Lifetime employment service to graduates.

Finance Plan—New liberalized credit terms. Enroll now, pay most of tuition later. Part time employment help to students.

BIG FREE BOOK Mail coupon. No obligation. No salesman will call. Act NOW.

COYNE ELECTRICAL SCHOOL — CHARTERED NOT FOR PROFIT Established 1899 500 S. Paulina, Chicago, Dept. 28-4R

COYNE Electrical School
500 S. Paulina St., Chicago 12, Ill., Dept. 28-4R

Send FREE BOOK and details of your training in TV-RADIO

Name_____

Address_____

City_____ State_____

PAINTING TIP NO. 42

Make professional-looking stripes with "SCOTCH" Brand Masking Tape. Stretchy tape sticks tight, hugs curved surfaces. Paint will not bleed through. After paint has "set", "SCOTCH" Masking Tape strips off easily, leaving a clean, sharp edge. Makes painting quicker, neater with brush, roller or spray. Get "SCOTCH" Brand in the handy cutter-edge carton—35¢, 69¢, 98¢, $1.69—wherever paint is sold.

Don't run short . . .
BETTER BUY TWO!

Made by
Minnesota Mining & Mfg. Co.
St. Paul 6, Minn.
© 3M Co., 1958

$1 BRINGS YOU $18

Discover Flok-Kraft and Earn $$$$$ AT HOME

Earn up to $15.00 per hour spare time. Amazing new Velvet-fiber spray instantly makes any object (Lamps, Radio & TV Cabinets, Figurines, Signs, Auto dash boards, toys, furniture, draperies—anything) worth expensive $$$$$ Prices . . . like magic, you can spray anything with this beautiful new suede-like finish that feels like rich Velvet.

EARN UP TO $300.00 PER WEEK SPARE TIME

Imagine, materials cost only 3¢ per square foot. (Average TV or radio cabinet can be beautifully sprayed with this startling new 3-dimensional Velvet finish in 15 minutes at a cost of only 34¢ in materials. Your charge for this job is at least $10.00.)

REPRESENTATIVES IN YOUR AREA URGENTLY NEEDED

Own your own business. Work at home in your spare time. Help fill the huge growing demand for this amazing new beautiful Velvet-fiber finish. Orders come from stores, offices, homes, architects, auto dealers,—everywhere. Possible $20,000,000.00 worth of jobs to be done. Investigate today—be first in your area!

Actual samples in 16 Radiant Colors, Booklet of 50 Home Business Opportunities and Confidential Details all sent free! Write: **Coast Industries, Los Angeles 61, Calif., Dept. A-2.**

TERRIFIC: 200 Miles per Gal. • 50 M.P.H. NO MONEY DOWN • 2 Yrs. to Pay

LEOPARD

Safe, inexpensive transportation for work and play. Heavy-duty 1-Cyl. German Precision Motor 2-Wheel Brake Control Guaranteed.

From **$11.00** per Mo.

Never before at this low price.

new '58 MOTORCYCLETTE made by German PANTHER Factory. Write for FREE BOOKLET # A-2. Dealer inquiries invited.

MOTORCYCLE IMPORT CORP. 505 5th Ave., N.Y. 17, N.Y.

GETTING UP NIGHTS

If worried by "Bladder Weakness" (Getting Up Nights or Bed Wetting, too frequent, burning or itching urination) or Strong Smelling, Cloudy Urine, due to common Kidney and Bladder Irritations, try CYSTEX for quick help. 30 years use prove safety for young and old. Ask druggist for CYSTEX under money-back guarantee. See how fast you improve.

AROUND THE WORLD

From New York on Jan. 1st TWA's Jetstream Constellation flew the mails over a **new** eastward route to far off **Bangkok** and on to **Manila**—then NWA's DC7c continued the flight to Seattle and New York, thus completing a **new** Airmail Route Around the World. You can have a cover flown in the **first flight** of this new route for only **50¢**—or send **$2.50** for a group of **10 all different First Flight** covers. Money back if not completely satisfied. Ask for our lists.

K. M. WALSH Box 308-F TUCKAHOE, N. Y.

FIX home & car APPLIANCES YOURSELF

NEW! **EICO® REDI-TESTER**

KIT $12.95 **Factory-wired $15.95**

All-in-one MULTI-RANGE ac/dc voltmeter, ammeter, ohmmeter, wattmeter, leakage checker. Locates defects in irons, fans, refrigerators, mixers, air-conditioning, TV & radio tubes and parts, batteries, generators, etc. Easy Instruction Book has introduction to electricity & procedures for common repair jobs. Examine EICO's complete line of 50 professional instruments & Kits — Write for FREE Catalog PS-2

Electronic Instrument Co., Inc. 33-00 Northern Blvd., L.I.C. 1, N.Y.

FREE TO HOME PLANNERS

Get your FREE copy of "Split Level Homes" book (value 50¢) FREE with your order for the 3 large Garlinghouse Plan Books described below.

These books show hundreds of new plans for "custom built" homes. All sizes and styles pictured from photos and colored drawings. Floor plan and accurate description of each plan.

- **Ranch & Suburban.** 126 plans most practical for town and country. Many in color **50c**
- **Homes in Brick.** Many of these 115 beautiful tested designs are in full color **1.00**
- **Blue Ribbon Homes.** 116 of our most popular designs. ☰ in full color. **50c**

Complete working plans, specifications, lumber and mill lists available for every plan at LOW COST. *All books mailed postpaid* so ORDER TODAY—*from America's largest home plan service.*

L. F. GARLINGHOUSE CO., INC., Box PS-28, TOPEKA, KANSAS

NEW! MODEL 400 SIMPLEX Lawnmower Sharpener

Small investment returns

Big Profits!

Many Exclusive Features . . .

The NEW SIMPLEX is the fastest, most accurate straight-line lawnmower grinder ever built . . . gives you all these advantages:

- **Grinds *all* mowers—reel type, rotary, hand or power, any size.**
- **No dis-assembly needed, gas and oil remain in engine, support bar rotates.**
- **Grinding head feeds both horizontally and vertically, turns 90° for bed knives.**
- **Fast, positive adjustments, 4-point support on steel base with leveling screws.**
- **Rugged, long life construction and many other features.**

THE FATE·ROOT·HEATH COMPANY

Dept. PS-2 • Plymouth, Ohio

Get the facts on the new Simplex 400 before you buy any sharpener.

Send for free brochure today!

DRAW The First Day!

NO LESSONS! NO TALENT!

New Amazing Invention—"Magic Art Reproducer." You can draw Your Family, Friends, Anything From REAL LIFE—Like An Artist. Even If You CAN'T DRAW A Straight Line! Anything you want to draw is automatically seen on any sheet of paper thru the "Magic Art Reproducer." Then easily follow the lines of the "picture image" with a pencil for an original "professional looking" drawing. Also reduces or enlarges. SEND NO MONEY! Free 10 Day Trial! Pay Postman on delivery $1.98 plus postage. Or send only $1.98 with order and we pay postage. Money Back Guarantee.

NORTON PRODUCTS, Dept. 199, 296 Broadway, N. Y.

LAW FREE BOOK — THE LAW TRAINED MAN

Write today for a FREE copy of illustrated law book, "THE LAW-TRAINED MAN," which shows how to earn the professional Bachelor of Laws (LL.B.) degree through home study of the famous Blackstone Law Course. All necessary books and lessons provided. Moderate cost; convenient monthly terms. Write for FREE law training book today.

Blackstone School of Law, 307 N. Michigan Ave.

Founded 1890 **Dept. 122, Chicago 1, Illinois**

LEARN MEAT CUTTING AT NATIONAL

Pay After Graduation

The steady dependable trade of Meat Cutting taught easily in 8 short weeks. YOU LEARN BY DOING under actual meat market conditions in big modern school at Toledo.

For beginners or men with experience. Get a profitable store of your own. Remember, PEOPLE MUST EAT! Big pay jobs. Free employment help. Thousands of successful graduates.

Buying, cutting, percentage, pricing, advertising, selling, etc. A complete retail meat education. National School established 35 years. Get National training NOW. Pay your tuition in easy weekly payments after you graduate. Send coupon for FREE 52 page school catalog — TODAY. G.I. approved.

National School of Meat Cutting, Inc.
Dept. S1-A, Toledo 4, Ohio

Send me your FREE school catalog on National Training at Toledo in Meat Cutting, Meat Merchandising and Self Service Meats. No obligation. No salesman will call.

Name.....Age.....

Address.....

City.....State.....

Approved for training Korean Veterans

EARN MORE—LEARN TO BE AN

AUTO MECHANIC

OR TRAIN WITH OTHER GREER DIPLOMA COURSES

- ☐ AUTO MECHANICS
- ☐ DIESEL MECHANICS
- ☐ BODY & FENDER REPAIR
- ☐ GAS-ARC WELDING
- ☐ REFRIGERATION
- ☐ AIR CONDITIONING
- ☐ MACHINIST TRADE
- ☐ ADVANCED MACHINIST
- ☐ PIANO TUNING & REPAIR

Skilled men are needed in every part of the country. Earn top pay in established shops or start your own business. Greer's expert instruction and actual shop training teaches you how. You learn by doing—quick, easy courses using the latest tools and equipment. Day, evening and part time instructions available.

Job placement and convenient living accommodations are yours while training. Contact GREER'S FREE JOB PLACEMENT SERVICE when you enroll if you wish part time or full time employment.

ENGINEERING DEGREE COURSES

- ☐ DIESEL AUTOMOTIVE ENGINEERING 27 MOS.
- ☐ REFRIGERATION & AIR COND. ENGINEERING 18 MOS.
- ☐ WELDING ENGINEERING 18 MOS.

All Courses Approved ☐ Civ. or ☐ G.I.

Please rush me free literature on Auto Mechanics, or on the trade indicated, at no obligation.

NAME_____ AGE_____

STREET_____

TOWN_____ ZONE____ STATE_____

Established 1902

GREER SHOP TRAINING

Box B, 2238 S. Michigan Ave.
Chicago 16, Illinois

EARN EXTRA MONEY

IN YOUR SPARE TIME . . . AT HOME

New Plastic-Fiberglass Process opens up excellent opportunities

if . . . you like to work with new ideas and materials and can use some extra cash, you'll be interested in our new manual "How to Earn Extra Money in Your Spare Time." It shows you what others have done, how they got started, what they make. Tells about how one man earned $1800.00 net profit in 6 weeks in his home shop and how you can do the same.

Illustrated Directions Show You How to embed real flowers, brilliant fall leaves, butterflies, sea shells, coins, photos in clear liquid plastic to make novelties, advertising specialties and other fast selling items. How to laminate translucent glass panels with embedments of unusual fabrics, grasses, seaweed and other interesting materials. How to use these panels for room dividers and screens, or fine lamps, bowls and trays. Also shows a new way of casting tiles and mosaics that is **Really New and Different.**

No Equipment Is Required because neither heat nor pressure are needed . . . just small hand or power tools. This process is made to order for the smaller operator with a garage or basement shop. The same basic materials used for laminating decorative glass panels are also used for repair work. If you are in the right location, for example, you may find your big opportunity "glassing" boat hulls, tanks, pools or develop a specialized, highly profitable industrial maintenance business.

How To Get Started

Get all the facts before you do anything else and send for "How to Earn Extra Money In Your Spare Time". It is a mighty valuable source book of ideas. Clear-cut directions and over 100 photos explain new methods of using plastic and fiberglass you can adapt to your own requirements. No other book like it has ever been published before. To cover mailing costs, send 25¢ to:

Commercial Craft Division, Dept. B-2
THE CASTOLITE COMPANY
Woodstock, Illinois

SHORTHAND IN 6 WEEKS

Write 120 words per minute
Age no obstacle—LOWEST COST

Famous SPEEDWRITING shorthand. No symbols; no machines; uses ABC's. Easiest to learn and use. Fast preparation for a better position. Nationally used in leading offices and Civil Service. 120 words per minute—50% FASTER than Civil Service requirements. Over 350,000 taught by mail or through classroom instruction. The very low cost will surprise you. Typing available. 35th Year. Schools in over 400 cities in U.S., Canada, Cuba, and Hawaii.

DID YOU SEE READER'S DIGEST ARTICLE ON

Write For Free Booklet To: School of

Speedwriting

Dept. 2602-8, 55 W. 42 St., N.Y. 36 ®

TV Famous Dan Lurie World's Champion Muscle Builder.

GUARANTEES TO BUILD YOUR MUSCLES FAST!

In just 6 weeks my amazing Body Mold course and famous adjustable barbells must give you bigger muscles, sensational power or money back. Get "revolutionary Body Mold" courses free with order. *Lowest factory price.*

DAN LURIE BARBELLS

50 LB. set 9.98	100 LB. set 14.98
150 LB. set 21.98	200 LB. set 37.98

Extra wts. 16c per lb. 50% cash with order. Balance C.O.D. F.O.B. plant.

DAN LURIE BARBELL CO.
52 S-2 Bristol St. Dept. 770-B Bklyn 12, N.Y.

FREE: Send For New Sports & Health Catalog

SIGHTING SCOPE

Gov't Surplus—Guaranteed Perfect.

- Built-in light for night sighting. (Takes 2 ordinary flashlight batt.)
- Built-in mountings. • 5½" long.
- Weight 1 lb. • Solid brass. 1.44x used mainly for sighting. Objective lens is at small end.

$4.95 ppd.

No COD's Gov't Cost $70

Achromatic coated prismatic lenses ideal for: Telescopes, Target spotting, Hunting, Surveying. Convert to erect microscope.

JOB LOT TRADING CO. 83 Vesey St. NY 7, NY

IS YOUR ENGLISH HOLDING YOU BACK?

I have helped thousands of men and women who have not had college training in English to become effective speakers, writers, and conversationalists. With my new C.I. METHOD you can stop making mistakes, build up your vocabulary, speed up your reading, develop writing skill, learn the "secrets" of conversation. Takes only 15 minutes a day at home. Costs little. 32-page booklet mailed FREE. Write TODAY! **Dan Solander, Career Institute, Dept. 1072, 25 E. Jackson, Chicago 4, Ill.**

Free Book on Arthritis And Rheumatism

HOW TO AVOID CRIPPLING DEFORMITIES

Explains why drugs and medicine give only temporary relief and fail to remove the causes; tells all about a specialized non-surgical, non-medical treatment which has proven successful since 1919. Write for this 36-page FREE BOOK today.

BALL CLINIC Dept. 36 Excelsior Springs, Mo.

TELEPHONES

and ALL SUPPLIES

Room to room, house to garage, private telephone service.

HANDSET CRADLE TELEPHONES (2) Complete outfit with 100' wire, 2 dry cells, instructions. $14.95

WORM HARVESTER—Dan Mac Magneto — gathers fish-worms by electricity. Complete with instructions. $6.50

FREE Illustrated booklet "AA-203"

TELEPHONE REPAIR & SUPPLY CO. Dept. AA-203
1700 Lunt Ave., Chicago 26, Ill.

NEW AMAZING DISCOVERY!

EXTRA

Make Money—Save Money. Earn $30—$50 a day. Plate for others—Start your own business (See Below)

NOW, FOR THE FIRST TIME EVER YOU TOO CAN

ELECTROPLATE

AND METALIZE METALS AND NON-METALS

BRILLIANT NEW **AUTO CHROME** + THOUSANDS OF OTHER OBJECTS

PLATE METALS & NON-METALS AS

copper • silver
brass • nickel
chrome • steel
leather • wood
plaster • plastic
etc.

HOW YOU CAN PLATE

cars • tools
machine parts
sports equip.
fishing equip.
guns • jewelry
silverware
radio parts
printed circuits
baby shoes
flowers, etc.

Yes, now for the first time ever, a fool proof PROFESSIONAL way to plating has been invented. VERY SIMPLE AND EASY TO USE. The same day you receive your plating outfit you can have shiny FACTORY NEW CHROME on your car. Think of all the money-saving fun you can have turning ordinary objects into valuable possessions. YES, THIS ELECTROPLATING OUTFIT WILL EVEN PLATE NON-METALS. A dream come true for auto owners, and do-it-yourself enthusiasts.

THRILLED USERS SAY . . . I purchased your kit and had lots of pleasure from it. Send re-order. I am anxious to continue my work. R. D., Calif. . . . Recieved my plating outfit; very much satisfied with results. D.A.N., Pa. . . . I have had no experience in plating. Obtained your book and kit, am well pleased. Now want to specialize plating baby shoes. S. J. H., Mass. . . . Very much satisfied. It is simple beyond any expectations. H. W. B., Miss. . . . Received the outfit; Find it works very good. J. G. S., Mo. . . . YES, THESE ARE THE STARTLING RESULTS OBTAINED BY JUST A FEW OF OUR MANY SATISFIED USERS.

PROFESSIONAL NEW CHROME BEAUTY. A HARD NEW DURABLE PLATE on your CAR CHROME the moment the applicator touches your car. When others see your SPARKLING NEW CHROME they will want their cars plated too. This is YOUR OPPITY to make BIG PROFITS plating for others. And here is the BEST NEWS YET . . . as an EXTRA BONUS you get all the material necessary to even plate non-metals. That's right . . . you get this and without even risking one penny. SO SEND FOR YOUR KIT NOW. YOU WILL BE AMAZED.

Guarantee

Every kit is guaranteed for 7 full days or your money back. During this 7 day FREE TRIAL you must be satisfied. It must do every thing we say it can. Or you will have tried it at OUR EXPENSE. You have nothing to lose. SEND FOR YOUR KIT NOW. You must be satisfied this is the greatest thing or it will not have cost you a penny.

Real plating at home, shop, garages, etc. It's easy . . . completely portable kit contains it's own power pack.

SEE AMAZING RESULTS

BEFORE AFTER

PLATE THESE AND 1000s of other objects with a bright lustre; durable, professional finish; old rusted objects turn new before your eyes.

FREE

Included FREE you get the FAMOUS BOOK, "SUCCESS IN YOUR ELECTROPLATING BUSINESS" valued at $5. Book contains inst. on plating CHROME, NICKEL, COPPER, SILVER, GOLD, ETC. PLUS complete details on starting YOUR OWN PLATING BUSINESS and making $30—$50 day plating for others. A GREAT OPPTY! This book is yours to keep even if you return the plating kit.

KIT CONTAINS. Electrolytic applicator, Chrome plating solution, Copper plating solution, Combs for plating non metals, Special metal polish, Fully illustrated instructions, KIT Box. NOTHING ELSE TO BUY. (Bottle readily available)

SEND NO MONEY. We will send you the COMPLETE ELECTROPLATING AND METALIZING OUTFIT, PLUS complete instructions on plating CHROME, COPPER, SILVER, GOLD, ETC. C.O.D. for the low price of ONLY $7.98OR SEND $7.98 NOW, and receive everything postpaid. The FREE book is yours to keep in any event. C. O. D. in U. S., P. R., Hawaii and Alaska only.

M. Z. SALES CO., DEPT. L-3, 113 WEST 42nd ST., NEW YORK 36, N. Y.

Don't Let Repair Bills Drain You Dry!

FIX, REPAIR, MEND Anything

Instantly With New Miracle Material
I Send You on FREE TRIAL!

Stop shelling out hundreds of dollars every year on repairs you can do yourself! With the help of just one miracle material, you can pocket the cash you're now spending on car repairs, boiler patching, and all the other little jobs that add up to big money! All you need is this one material and I'm going to send it to you for a ten days' FREE TRIAL without your risking a cent!

By JOHN MOSS
Technical Engineer

There are things around your home, office, farm, factory, on your car which you *could* fix yourself if you had the right kind of material. More than 10,000 industrial plants and factories are now using material I'm talking about. It's been proven and tested by engineers—men who know! The name of this product is Plastic Metal. You apply it like putty . . . and it hardens like STEEL. So hard you can hit it with all your might with a sledge hammer! Plastic Metal is a permanent solid metal filler . . . one of the strongest adhesives in the world. The list of things Plastic Metal can help you repair is endless. Fix cracked motor blocks, fenders, lamps, bathtubs, sinks, sporting equipment, engines. Sticks to any surface. Never rusts! Can be sanded, filed, drilled, buffed. Fix anything that's cracked, chipped, dented or damaged. Repair like new pipes, boilers, boats, jewelry, bikes, lamps. Reset bathroom tiles, bricks. Plastic Metal fixes anything!

GET FREE-TRIAL SUPPLY AT NO RISK!

The only real way I can demonstrate that Plastic Metal can save you hundreds of dollars is to let you put it to use at my risk! Here's my offer: Mail $1.98 now. I'll send you a full supply of Plastic Metal. Use it to repair and fix anything you like. It's so easy . . . so simple! Just apply and let dry. After the test, if not absolutely convinced Plastic Metal is all I say and **more**, return it for full refund. You risk nothing! Act now! (SAVE! Triple free-trial size, only $2.98)

SCOTT-MITCHELL HOUSE, INC.
611 Broadway Dept. NS-144 New York 12, N. Y.

PREPARE FOR BETTER JOB, BIGGER PAY IN SPARE TIME AT HOME

Today, choose the job you want—and prepare for it in time you might otherwise waste. Or if you are already in the work you like best, start training now for quicker promotion and increased pay. During the past 61 years AMERICAN SCHOOL has helped ambitious people to reach higher goals. Check subject that interests you and mail coupon for full information.

AMERICAN SCHOOL, Dept. G246, Drexel at 58th, Chicago 37, Ill.
Without obligation, please send FREE and postpaid, full particulars about the subject checked below.

☐ Accounting
☐ Apprenticeship Courses
☐ Architecture & Building
☐ Automotive Technician
☐ Better Foremanship
☐ Blueprint Reading
☐ Bookkeeping
☐ Business Management
☐ Civil Engineering
☐ Contracting
☐ Diesel Technician
☐ Drafting—Building Trades
☐ Drafting—Machine Trades
☐ Electrical Engineering
☐ Electricity—Practical
☐ Electronics—Industrial
☐ HIGH SCHOOL COURSES
☐ Machinists
☐ Mechanical Engineering
☐ Mechanical Technology
☐ Metalworking Courses
☐ Plumbing—Practical
☐ Private Secretary
☐ Retail Merchandising
☐ Salesmanship—Outside
☐ Sheet Metal Work
☐ Tool Making

NAME.....
OCCUPATION.....
HOME ADDRESS.....AGE.....
CITY.....STATE.....

MAIL COUPON NOW

TRAINED MEN NEEDED!

IN INDUSTRY—ARMED FORCES

BIG PAY!—GOOD FUTURE!

☐ DIESEL ☐ ELECTRONICS

☐ AUTO ☐ AUTOMATION

NEVER BEFORE has the opportunity been so good for the properly trained mechanic and technician to step into BIG PAY POSITIONS with rapid advancement and future security virtually assured.

YOUR SUCCESS depends on the quality of training you receive . . . and the reputation of the school you attend.

YOUR GUARANTEE we are giving the best in mechanical and technical training is proved by the fact . . . High pay jobs in Industry, and ratings in the Armed Forces now waiting for our graduates.

RESIDENT SHOP TRAINING is easier and costs less than you may think! We provide you with housing and part-time jobs while in school, plus free nation-wide placement service for graduates.

Check subject above in which you are interested and mail for

FREE BOOKLET

Your Future in ELECTRONICS AND AUTOMATION

BAILEY Technical Schools

Veteran Approved

1650 S. Grand, St. Louis 4, Mo.

Your Future in DIESEL and AUTO MECHANICS

Name_____ Age_____

Street_____

Town_____ Zone____ State_____

LEARN UPHOLSTERY

in your spare time run your own business AT HOME

FREE BOOK with sample lessons

with course

YOU MAKE SLIPPER CHAIR

CLUB CHAIR

OTTOMAN

PLUS SLIP COVERS *Yours to Keep or Sell*

BE YOUR OWN BOSS

Earn more from the start! Set up your own profitable business, in your own home, enjoy steady income, independence for life—in the booming field of Custom Furniture Upholstery. **Right off** you start learning and earning with tools, complete frames, fabrics and materials, included **FREE** with practical UTS course. You learn skilled professional custom upholstery, reupholstery, furniture finishing, repairs, how to make beautiful slip covers, window cornices, cushions and draperies. EARN WHILE YOU LEARN, in your spare time AT HOME . . . the UTS easy way.

FREE ILLUSTRATED BOOK—FREE SAMPLE LESSON

Get ready for well-paid job and big profits, from steady work, as your own boss, running your own business. Mail coupon NOW for FREE BOOK! Training in N. Y. School also available.

APPROVED FOR VETERAN TRAINING

UPHOLSTERY TRADES SCHOOL
Dept. GB-1610, 721 B'way, N. Y. 3, N. Y.

Please send me **FREE** book "Your New Way to a Successful Career," and **FREE** sample lesson. No obligation—no salesman will call.

☐ Home Study ☐ N. Y. School Training

Name_____

Address_____ Please Print Plainly

City_____ Zone____ State_____

☐ Check if Korean Veteran

$40 for 1½ DAY'S SPARE TIME WORK GRINDING LAWNMOWERS

Yes, J. H. B. writes, "not bad for a 76 year old young fellow earning $40 for a day and a half's work" . . . and others are making even bigger money with the Universal Model B Lawnmower Grinder. You, too can make good spare or full time profits in your own business in your garage or basement. We furnish everything you need. Write today. No cost or obligation. Dept. P-28.

ROGERS MANUFACTURING CO.
LINDSEY, OHIO

FOR BIG MEN ONLY!

SIZES 10 - 16 — WIDTHS AAA - EEE!

We specialize in LARGE SIZES ONLY—sizes 10 to 16, widths AAA to EEE. Dress, sport, casual and work shoes; golf shoes; insulated boots; sox; slippers; rubbers; overshoes; shoe trees. Also . . . sport shirts in your exact, extra-long sleeve length. Enjoy perfect fit in your hard-to-find size at amazingly low cost. Satisfaction Guaranteed. Sold by mail only. Write for FREE Style Book TODAY!

SEND FOR FREE CATALOG

KING-SIZE, INC. 557 Brockton, Mass.

BETTER PAY, PROMOTIONS

Learn at home for faster advancement in Industry! 2 important Acme courses provide basic education for industrial work—SHOP MATH and MECHANICAL DRAWING. Both are complete, thorough, 100-hour courses—either will **better equip** you for rapid advancement! Or go on to our famous

TOOL AND DIE DESIGN TRAINING

the only complete and thorough course in this important growing field. Write today for free information (specify course) to Acme School, Dept. 101, 50 S. Jefferson St., Dayton 2, Ohio.

EYE GLASSES *by* MAIL As low as $1.95

WRITE for FREE CATALOG with 14 LENS SAMPLE CARD

Thousands of Customers

Est. 1939

QUALITY READING-MAGNIFYING OR BIFOCAL GLASSES FOR FAR AND NEAR

ADVANCE SPECTACLE COMPANY, Inc.
537 S. Dearborn St., Dept. SP-2 Chicago 5, Illinois

"Service Model"

No. 1 Stainless Steel adjustable Plain Clips **$3.95**

"The Guardsman"

No. 2 With Beautifully Embossed Stainless Steel Clips **$4.95**

Here's Why **IT'S SO PRACTICAL!**

Has only 2 moving parts

- No hidden springs • Hygienic
- Perspiration Proof • Non-Corrosive
- Non-Magnetic • Conforms to the wrist—most comfortable to wear
- Fully guaranteed

RESILIENT STAINLESS STEEL

Contour CLASP-ON WATCH BAND FOR MEN

WRIST SIZES

Small 6¼"—Medium 6⅝"—Large 7"

AT YOUR JEWELERS OR WRITE DIRECT

Illustrated Brochure on Request

Don Juan WATCH BANDS 29 E. MADISON ST. CHICAGO 2, ILL.

Be Your Own Boss in the Profitable Excavating Business!

EARN UP TO $1,000 AND MORE PER MONTH

Wherever you live, you'll find plenty of profitable work the whole year 'round for this versatile outfit . . . not just a "trencher" but an all-purpose excavating machine! Custom operators everywhere are making big money with Sherman Power Diggers. ONE BOUGHT A FARM WITH JUST THREE YEARS' PROFITS! Work for builders, contractors, utilities, and municipalities on such jobs as septic tanks and drainfields, sewer lines, fuel tank installations, foundations and footings, gas and water lines, field tilling and many others. The Sherman Power Digger mounted on a Ford Tractor travels quickly from job to job, digs at a fraction of the cost of manual labor. It's simple to operate, easy to maintain, built to last.

Send now for information about the easy-to-get jobs for your Sherman Power Digger. Let us tell you—without obligation—how you can go into business for yourself with an investment of less than $5000. Or make a small down payment and pay the balance from earnings.

SHERMAN PRODUCTS, Inc.
Dept. 4936R Royal Oak, Michigan

Send Now for FREE LITERATURE!

Sherman Products, Inc.
Dept. 4936R — Royal Oak, Michigan

Send me information on how I can get into the excavation business on my own.

NAME _____

ADDRESS _____

CITY _____ STATE _____

"I'll Show You How to Have Giant Strength, Health and Success"

Says: Paul Anderson
THE WORLD'S STRONGEST MAN AND GOLD MEDAL OLYMPIC CHAMPION.

"I built myself up from skin and bones; almost died as a youth. My parents' prayers and my own determination pulled me through and led me to discover my four great secrets of body building might.

"You, too, can have the body you want with full muscular development, robust health and right weight. Learn how you can transform your life with my course and a few minutes each day. Don't delay—Act NOW!"

MAIL COUPON TODAY!

Paul Anderson, Toccoa, Ga.
Send me FREE your illustrated book giving full details of "Easy Steps to Giant Strength."

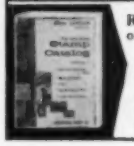
Name _____
(Please print)
Address _____
City _____ *Zone* ____ *State* _____

Dept. PS2

Free! SCARCE TRIANGLE COLLECTION

Start TODAY to enjoy an exciting new hobby! Get this big, valuable collection of gorgeous, multi-colored triangle shaped postage stamps . . . brought to you from strange and mysterious lands in the wilds of Africa, enchanting Europe, exotic Latin America, etc. All genuine, all-different—picturing man-eating reptiles, jungle birds, action-packed sports, ancient clipper ships; **PLUS** scarce airmails, fabulous commemoratives, giant and midget-sized stamps. **EXTRA!** Bargain Catalog, "Collector's Manual" plus other exciting offers for your inspection. Enclose 10c for mailing costs. Supplies limited. ACT NOW!

JAMESTOWN STAMP CO. DEPT. H28PS JAMESTOWN, N.Y.



RUSH my Free "Triangle" Collection and other offers. I enclose 10c for mailing costs.

Name _____
Address _____
City & State _____

PREPARE FOR THE BEST JOBS IN INDUSTRY

STUDY AT HOME
in your spare time or at ALLIED INSTITUTE Chicago 5, Illinois

- Drafting—ALL BRANCHES
- Tool & Machine Design
- Tool Engineering [Bachelor Degree TE]
- Mech. Engineering [Bachelor Degree ME]
- Master Machinist
- Tool & Die Making
- Auto Mechanics
- Air Conditioning
- Refrigeration

MORE JOBS THAN GRADUATES

You can begin your training in Short Courses and continue progressively toward an Engineering Degree in 31 months. Allied is approved by Industry, National Home Study Council, Dept. of Education, Office of Public Instruction, State of Illinois, U. S. Dept. of Justice.

SEND FOR **FREE** BOOKS

Allied Institute of Technology
1338-42 South Michigan Ave., Dept. PS-28, Chicago 5, Ill.
Send me without obligation information on your courses:

☐ Drafting—All Branches ☐ Master Machinist
☐ Tool & Machine Design ☐ Tool & Die Making
☐ Tool Engineering ☐ Auto Mechanics
☐ Mech. Engineering ☐ Air Conditioning
☐ Refrigeration

☐ HOME STUDY ☐ RESIDENT ☐ VETERAN ☐ NONVETERAN

NAME _____
ADDRESS _____
CITY _____ COUNTY _____ STATE _____

NOW The Short Cut to Learning You've Been Waiting for

Learn "By Ear" with the DORMIPHONE

The Scientific Discovery That Works for You . . . Awake and Asleep

Now, at last, science gives you an easy shortcut to learning. With this amazing new tool, you **"start" to learn while awake**—then the university-tested Dormiphone takes over, **continues the learning process for you while you go off to sleep.**

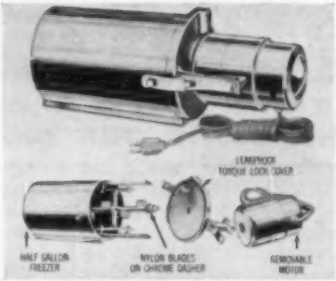
Do you want to learn a language—memorize a speech or an array of important facts, figures, formulas—Correct your speech—Break bad habits? The Dormiphone SAVES YOU TIME—EFFORT. So simple to use, children benefit—so helpful and practical it is used by educators, psychologists, people of all ages, occupations all over the world.

Break Down Barriers to Learning

Find out HOW the Dormiphone works FOR YOU—how it can help you learn anything in less time, without intensive self-application. Write for FREE Book, "A New Dimension in Learning," or call for FREE DEMONSTRATION—Get the Scientific Evidence **Today.**

MODERNOPHONE, INC.
262-028 Radio City, New York 20, N. Y.
Gentlemen: Please send me your FREE Booklet. I am interested in learning more about the DORMIPHONE and what it can do for me. No obligation—no salesman will call.
☐ If under 18, check here for Special Booklet A.

NAME _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____
My main interest in the Dormiphone is for:
☐ Learning a Language ☐ Speech Improvement
☐ Memorization ☐ Sleep Inducement
☐ Habit Correction ☐ School or College Work



AUTOMATIC ICE CREAM MAKER

BEST ICE CREAM MADE, IN MINUTES FOR PENNIES! In the KNIBB ICE CREAM MAKER. Delicious old fashioned, paddle-made ice cream, sherbets, fruit ices, frosted milk shakes . . . up to ½ gallon at a time . . . in this patented, compact electric machine . . . fits into freezing compartment of refrigerator or home freezer. Automatic, thermo cut-off switch stops motor when freeze-whipping is completed. Bright chrome finish. Removable 110 V. AC motor. 9 ft. cord (refrigerator door closes over cord—won't harm it). Leakproof cover. Removable nylon scraper-paddles. Home Economist and U.L. approved. 5 x 12½ in. Recipe and instruction booklet included. SATISFACTION GUARANTEED OR MONEY BACK.

Postage Prepaid $34.95
KNIBB INDUSTRIES, INC.
360 N. MICHIGAN AVE. CHICAGO 1, ILL.

NEW FALSE PLATE FROM YOUR OLD ONE IN 18 HOURS

AS LOW AS $14.95

Send us your old broken, cracked or loose plates and we'll transform them into new lightweight wonder plastic plates. NO IMPRESSIONS needed with our revolutionary method. We use your own old plates. We remake them completely in only 18 hours. Missing teeth carefully matched and replaced. We GUARANTEE TO SATISFY YOU OR REFUND YOUR MONEY.

SEND NO MONEY—Send us your name today and we'll RUSH COMPLETE DETAILS. Begin to enjoy life right now. Clip this Ad; save it and send for free facts.

CHICAGO DENTAL PLATE LABORATORY • Dept. PS 258
30 N. Dearborn St. • Suite 714 • Chicago 2, Ill.

FABULOUS, NEW

5 FOOT LONG BALLOONS

Twist Into A Thousand Shapes!

GIRAFFES-DACHSHUNDS—Pets of All Kinds

Made of Live Latex **200 FOR $1** Add 25c Postage and Handling

Delight Kiddies — Grown-Ups, Too!

Fantastically flexible Live Latex! Like no other balloons you've ever seen! Twist 'em, bend 'em — they won't break! Cut them in half or any size — twist, and they reseal! The kiddies will have a whale of a time making them into Davy Crockett hats, pretzels, giraffes, lions, fish — a whole zoo! You'll want them for unusual party or recreation room decorations! Liven up a party with a contest for making the funniest shape of all! Complete instructions.

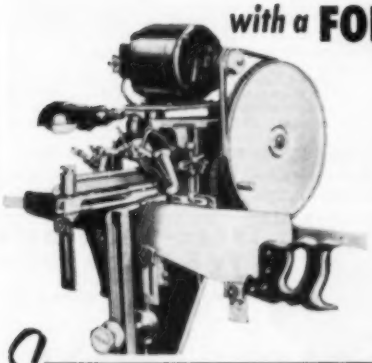
Almost 5 feet long when inflated. Balloons this size usually sell up to 25c each!

Send only $1 now. Plus 25c postage and handling for 200 in a variety of gay colors! Supply limited at this low price, so order several sets NOW for GUARANTEED PROMPT DELIVERY. MONEY BACK GUARANTEE.

MURRAY HILL HOUSE
Dept. B-13, P. O. Box 251, Bethpage, L.I. N.Y.

Last year's profit $3,000!

with a FOLEY AUTOMATIC SAW FILER



"Last year's profit amounted to $3,000. Not so bad for a one-man outfit"—from Chas. C. Hough. James B. Williams wrote us—"I made $765 last year filing saws, and it sure comes in handy. I do this work in my spare time." Men in communities of all sizes make up to $3 or $5 an hour with the Foley Saw Filer working full time or part time.

It's no trick to take care of the saw filing for your neighborhood hardware or lumber dealer — plus looking after the saws for farmers, townspeople, manual training departments and factories. The Foley files all hand saws, also band and cross-cut circular saws. It's a repeat cash business, no canvassing, no eyestrain and no experience needed.

Send Coupon for FREE BOOK

SHOWS HOW TO START

"MONEY MAKING FACTS" shows just how you can start at home in your spare time working in your basement or garage. It's an immediate cash business that can develop into a full-time repair shop. Send coupon today—no salesman will call.

FOLEY MFG. COMPANY
219-8 Foley Building, Minneapolis 18, Minnesota
Send me free book "MONEY MAKING FACTS"

Name_____

Address_____

YOU MAKE 'EM WE SELL 'EM!

Let me show you how to build a big pay business of your own without canvassing, without house-to-house selling!

I'll show you a simple easy way to make dozens of "Made-to-Order" cases for musicians, salesmen, hunters, manufacturers, fishermen, gun collectors, photographs and 1001 other portables. I'll supply instructions, tools, materials — everything you need. My plan is absolutely safe! **You risk nothing!** Keep your present job and work sparetime until you decide to devote full time to this big pay work that is so fascinating . . . Set up your shop wherever you have a few spare feet. With my plan anyone can have his own business without a big investment and without previous experience; **and remember you don't have to worry about sales because my National Sales Staff sells for you.**

I am very satisfied to make a small profit because I can count on big volume on the supplies I sell to Casecrafters, yet home workers make a big profit because the finished cases sell for up to ten times the cost of materials . . . Write for full, FREE, details today.

MY NATIONWIDE SALES ORGANIZATION WANTS TO WORK FOR YOU!

ABARSI CASECRAFT 407 SUNSET BOULEVARD Dept 22 Los Angeles, Calif.

Get into.. PLASTIC LAMINATING AT HOME!

THIS MAN . .
. . . is taking out of the machine a Plastic Sealing Job — ordered by mail — only 11c in material cost brings back $2.58 in cash by mail. Capacity of machine: **$28.00 profit per hour of operation.**

Get ORDERS and CASH from your mailman—do work in SPARE TIME at home —or expand into FULL TIME business.

Send coupon for Free facts about the newest and most fascinating of all home operated businesses. For the first time a simplified machine brings the fabulous profits of **Plastic Sealing** and **Plastic Laminating** within the reach of the small operator. Anyone can learn to operate the machine with a few minutes practice — then with our **Magic Mail Plan** can get mail orders pouring in daily with cash in every envelope. ***No canvassing—no selling.*** We even supply the circulars you mail to bring back cash and orders. Don't waste a minute. Rush your name. We'll send you FREE and postpaid, pictures, prices, details, and all the facts you need to start. Mail coupon or send name on postcard. No charge.

Make $20 to $30 a Day by.. MAGIC MAIL PLAN!

Make Thousands of Beautiful Art Creations

COSTUME JEWELRY • CIGARETTE BOXES TRAYS • CANDLESTICKS • COASTERS LAMP BASES • BOOK ENDS...ALL IN SPARKLING COLORED PLASTIC

Warner Electric Co., 1512 Jarvis Av., Dept. L-3-B, Chicago 26, Ill.

WARNER ELECTRIC CO., 1512 Jarvis Av. Dept. L-3-B, Chicago 26, Ill.
At no cost to me, please rush complete details postage prepaid. I am under no obligation.

*Name*_____

*Address*_____

*City*_____ *Zone*____ *State*_____

FREE! U.S. STAMPS
PLUS COMPLETE U. S. CATALOG

Sensational Get-Acquainted Offer — From World's Largest Stamp Firm! FREE . . . scarce genuine postage stamp, as illustrated, picturing first U.S.A. (issued in 1847) **PLUS** Big collection of 30 all-different United States-19th century, valuable $1 stamp, etc. **PLUS** collection beautiful Commemoratives including American Revolution, Wild West, 1893 Columbian, many others. **EXTRA:** Big Bargain Catalog of all U.S. Postage issues; other exciting offers; Stamp Collector's Guide. Send 10c to help cover mailing costs. *Mail Coupon Today!*

H. E. HARRIS & CO.
4131 Transit Building, Boston 17, Mass.
Rush my United States stamps and other offers. I enclose 10c for mailing expenses.

Name .....
Address .....
City & State .....

Get Your First Class Commercial
F.C.C. LICENSE

The key to better jobs and higher pay in electronics is a 1st class commercial (not amateur) F.C.C. license—Federal Gov't evidence of your qualifications as an operator-technician. We train you quickly—by mail or in resident classes. Get your 1st class F.C.C. license in 12 weeks—NO previous training necessary. Our schools are located in Hollywood and Washington. Write to the school nearest you for our FREE booklet of details.

GRANTHAM SCHOOL OF ELECTRONICS, Desk 85-B
1505 N. Western Ave. Hollywood 27, Calif. OR 821—19th Street, N.W. Washington 6, D.C.

Now! **TEST YOUR OWN TV & RADIO TUBES**
for filament breaks
all of them—even picture tube

Nearly half of TV service calls are due to defective filaments. Tester shows if filaments are good. Insert tube in tester. Light shows if tube is burned out. Easy, safe. One service call saved pays for tester. Metal case. AC or DC. Checks fuses, appliances, etc. Only $3.95 ppd. or C.O.D. plus charges. Deluxe Model $4.95. Instructions. Guaranteed.

GEIGER ENGINEERING CORP.
3735 West Lawrence Avenue
Dept. SC-106 Chicago 25, Ill.

ELECTRIFY YOUR SEWING MACHINE! **NEW LOW PRICE! $10.95 90 DAY Guarantee**

Buy direct and save! Kit comes fully wired, installed in a jiffy. Fits all machines. ALL-NEW PARTS! • AC-DC Motor & bracket • Multi-speed foot control • Cord set & block • 115 v 60 c • Full instructions • Steel pulley & belt BONUS: 10 day free trial. Reg. $2.95 Sewlite given FREE with kit. Reg. $7.95 pinking shears only $1 with order. Send no money. Kit sent C.O.D. Or send money order and we'll pay postage. State whether wheel on your machine turns towards or away from you. Shipping wt. 6 lbs.

SENOR SEWING MACHINE CO., Box 142, Dept. PS-24, Stuyv S. N. Y.

Attachable Cutter Blades

Electric Unit cleans pipes 3" to 12"

CLOGGED SEWERS?
REMEMBER THE COSTLY PLUMBING BILL—

Chicago—Feb. 1st. Just introduced is a Free Booklet on machines which enable the Home Owner, Janitor or Factory Maintenance Man to Rod-it-himself—

Yet anyone can operate this **new Rodding Tool** which is whirled down the drain in a few seconds. SINKS, BATHTUBS, TOILETS, URINALS, FLOOR DRAINS, HOUSE TO STREET SEWERS can be cleared of Rags, Grease, Paper, Sand while Cutter blades can be added for removing roots. A new discovery in Swedish Music Wire gives the rod 100% more Flexibility.

Another new unit is the Miller Electric Rodder which has patented cutters that expand automatically to the size of the pipe. It will clean out heavy obstructions in pipe diameters 3" to 12". Smaller Sizes available. But now, what are these Tools worth in **COSTLY PLUMBING BILLS SAVED.** Tear this Ad out—and write your name and address beside it for **FREE BOOKLET** on Hand and Electric Units. Obey that urge. No Agent will call. A postcard will do (Chicago Phone Kildare 5-1702)

MILLER SEWER ROD, Dept. FEB
4640 N. CENTRAL AVE., CHICAGO 30, ILLINOIS

GOVERNMENT 40 ACRE
OIL LEASE $100

Act of Congress gives citizens equal rights with Oil Co's. to obtain Govt. leases. You do no drilling, yet may share in fortunes made from oil on public lands. (Payments if desired) Licensed & Bonded Oil Brokers. Free Information & Maps of booming areas. Write:

NORTH AMERICAN OIL SURVEYS
8272-AN Sunset Blvd., Los Angeles 46, Calif.

OVERLOAD SPRINGS

$11.95 Per Pair postpaid
2000 LB. SIZE $14.95

For cars and trucks. Front or rear. Gives 2000 lbs. extra capacity for all ½, ¾, and 1 ton trucks; 500 or 1000 lbs. extra for all cars. Easily installed. Guaranteed. State make, model, and year.

BRINKMAN MANUFACTURING CO.
5401 W. 21st Dept. 628 Topeka, Kans.

ANOTHER OF INDUSTRY'S
MOST-WANTED MEN
Aero-Engineering Technician
—to work with top engineers and scientists on jet and rocket design. I.C.S. can help you qualify for starting position.

SEE SPECIAL OPPORTUNITY CHECK-LIST—PAGE 51

SEWS LEATHER
AND TOUGH TEXTILES LIKE A MACHINE

With SPEEDY STITCHER Automatic Sewing Awl, anyone can quickly and skillfully sew or repair anything made of LEATHER, CANVAS, NYLON, PLASTIC, or other heavy materials. Sews firm, even lock-stitches like a machine. Gets into hard-to-reach places. Specially made for heavy duty sewing on LUGGAGE, FOOTWEAR, RUGS, AWNING, SAILS, SADDLERY, UPHOLSTERY, OVERALLS, AUTO-TOPS, SPORTS GEAR, and other tough sewing jobs. Here's the handiest tool you'll ever own. Will save you many times its small cost. Comes ready for instant use . . . complete with bobbin of waxed thread and 3 different types of diamond-pointed needles. Easy-to-follow directions will make you an expert in minutes. Extra needles and waxed-thread always available. Save money, send $1.98 for postpaid delivery. If C.O.D., $1.98 plus postage. MONEY BACK GUARANTEE.

ONLY 1.98

SPORTSMAN'S POST
366 Madison Ave., Dept. A-52, New York 17

Earn $217 a Month EXTRA With My FREE SHOE OUTFIT!

Just 2 Sales a Day Does It!

Rush a postcard today for my powerful FREE Shoe Selling Outfit. It contains **everything** you need to start a steady profit, repeat-order shoe business! Just 2 sales a day earns you up to **$217** a month EXTRA! It's amazingly **easy!** Just show friends, relatives Mason's famous shoes with comfortable Air-Cushion innersoles. People like buying the Mason way because they choose from over 160 dress, sport, work styles for men and women—including Nylon mesh, Cush-N-Crepe and Safety Toe work shoe styles. Because you draw from stock of 200,000 pairs, in an amazing range of sizes and widths, customers get the **exact** size, width and style they order! Our shoes are not sold in stores . . . people must buy from YOU! Start making BIG MONEY now . . . send for your FREE Special Outfit TODAY! →

Write TODAY!

MASON SHOE MFG. CO.
DEPT. A-140
CHIPPEWA FALLS, WIS.

75 POWER TELESCOPE 25X-45X-75X $3.98

NEW 3 in one telescopes, 3 variable 25X 45X-75X magnification. Brass bound. 25 power for ultra bright images 45 & 75 power for long range. Guaranteed to bring distant stars, moons, objects, sports 75 times closer. Most powerful scope sold anywhere near this amazing low price. American made, 5 sections. Opens 36", closes 1 ft.; contains 4 ground & polished lenses. Can also be used as powerful compound microscope. Mass production enables us to offer telescope complete at $3.98 postpaid. Money back guarantee.

CRITERION CO., Dept. PSB 56 331 Church St., Hartford, Conn.

PROTECT YOUR HEALTH

and Increase Your Comfort

Send at once for FREE folder. Learn how proper humidity helps you avoid colds, respiratory disease; how to be more comfortable on less fuel. Write Dept. PS-2.

THE HUMIDIFIER ASSOCIATION
20211 Harvard Avenue
Cleveland 22, Ohio

SAVE $10.00

NORELCO "Speedshaver" Men's Electric Shaver. Latest model, brand new and fully guaranteed. Complete with case, cord and cleaning brush. Regularly retails at $24.95. Our price $14.95 postage pd. All orders filled within 24 hours. Your money back if you are not fully satisfied. Send check or money order to

JOHN BROOKS, Dept. 013, Box 212, St. Louis 3, Mo.

10" Slide Rule

ONLY **98¢** postpaid

ANYONE WHO UNDERSTANDS SIMPLE 7TH GRADE ARITHMETIC CAN USE THIS STANDARD SLIDE RULE!

Be modern—use this quick easy way of figuring. For business men, students, carpenters, machinists, salesmen, printers and engravers, office workers, farmers, merchants, time keepers, plumbers, electricians—everyone who does figuring can save time and labor with this slide rule.

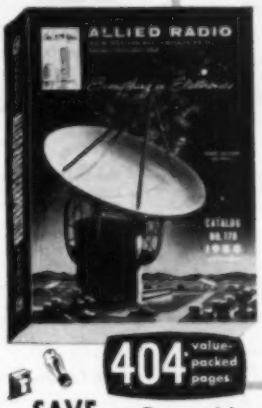
FREE *Illustrated Instruction book shows you how to get correct answers instantly without pencil and paper. (You get BOTH slide rule and instruction book for only 98¢ postpaid. Satisfaction guaranteed or refund.)*

Nelson-Hall Co., 210 S. Clinton, Dept. BS-1, Chicago 6

see the amazing new EASY-TO-BUILD ELECTRONIC ALLIED knight-kits in ALLIED'S 1958 ELECTRONIC SUPPLY CATALOG

FREE!

BUILD YOUR OWN! SAVE MONEY—HAVE FUN



HI-FI KITS

HOBBY KITS

INSTRUMENT KITS

HAM KITS

404 value-packed pages

SAVE on Everything in Electronics

WORLD'S LARGEST STOCKS

Everything for Experimenters, Builders, Amateurs, Servicemen, Engineers and Hi-Fi Hobbyists. Get more for your money in Hi-Fi systems and components; build-your-own KNIGHT-KITS; recorders and phono equipment; TV tubes, antennas, accessories; Amateur station equipment; test instruments; industrial electronic equipment—plus the world's largest stocks of parts, tubes, transistors, tools and books. Send today for your FREE 1958 ALLIED Catalog!

Everything in Electronics From One Reliable Source

over 37th year EASY TERMS AVAILABLE

ALLIED RADIO

send for FREE Catalog

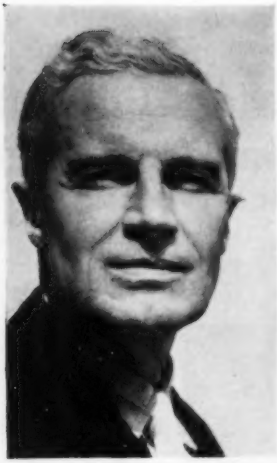
ALLIED RADIO CORP., Dept. 111-B8
100 N. Western Ave., Chicago 80, Ill.

☐ Rush FREE 1958 ALLIED 404-Page Catalog

Name _____

Address _____

City _____ *Zone* ____ *State* ____



I'd like to give this to my fellow men...

while I am still able to help!

I was young once, as you may be—today I am older. Not too old to enjoy the fruits of my work, but older in the sense of being wiser. And once I was poor, desperately poor. Today almost any man can stretch his income to make ends meet. Today, there are few who hunger for bread and shelter. But in my youth I knew the pinch of poverty; the emptiness of hunger; the cold stare of the creditor who would not take excuses for money. Today, all that is past. And behind my city house, my summer home, my Cadillacs, my Winter-long vacations and my sense of independence—behind all the wealth of cash and deep inner satisfaction that I enjoy—there is one simple secret. It is this secret that I would like to impart to you. If you are satisfied with a humdrum life of service to another master, turn this page now—read no more. If you are interested in a fuller life, free from bosses, free from worries, free from fears, read further. This message may be meant for you.

By Victor B. Mason

I am printing my message in a magazine. It may come to the attention of thousands of eyes. But of all those thousands, only a few will have the vision to understand. Many may read; but of a thousand only you may have the intuition, the sensitivity, to understand that what I am writing may be intended for you—may be the tide that shapes your destiny, which, taken at the crest, carries you to levels of independence beyond the dreams of avarice.

Don't misunderstand me. There is no mysticism in this. I am not speaking of occult things; of innumerable laws of nature that will sweep you to success without effort on your part. That sort of talk is *rubbish!* And anyone who tries to tell you that you can *think* your way to riches without effort is a false friend. I am too much of a realist for that. And I hope you are.

I hope you are the kind of man—if you have read this far—who knows that anything worthwhile has to be *earned!* I hope you have learned that there is no reward without effort. If you have learned this, then you may be ready to take the next step in the development of your karma—you may be ready to learn and use the secret I have to impart.

I Have All The Money I Need

In my own life I have gone beyond the need of money. I have it. I have gone beyond the need of gain. I have two businesses that pay me an income well above any amount I have need for. And, in addition, I have the satisfaction—the deep satisfaction—of knowing that I have put more than three hundred other men in businesses of their own. Since I have no need for money, the greatest satisfaction I get from life, is sharing my secret of personal independence with others—seeing them achieve the same heights of happiness that have come into my own life.

Please don't misunderstand this statement. I am not a philanthropist. I believe that charity is something that no proud man will accept. I have never seen a man who was worth his salt who would accept something for nothing. I have never met a highly successful man whom the world respected who did not sacrifice something to gain his position. And, unless you are willing to make at least half the effort, I'm not interested in giving you a "leg up" to the achievement of your goal. Frankly, I'm going to charge you something for the secret I give you. Not a lot—but enough to make me believe that you are a little above the fellows who merely "wish" for success and are not willing to sacrifice something to get it.

A Fascinating and Peculiar Business

I have a business that is peculiar—one of my businesses. The unusual thing about it is that it is needed in every little community throughout this country. But it is a business that will never be invaded by the "big fellows". It has to be handled on a local basis. No giant octopus can ever gobble up the whole thing. No big combine is ever going to destroy it. It is essentially a "one man" business that can be operated without outside help. It is a business that is good summer and winter. It is a business that is growing each year. And, it is a business that can be started on an investment so small that it is within the reach of anyone who has a television set. But it has nothing to do with television.

This business has another peculiarity. It can be started at home in spare time. No risk to present job. No risk to present income. And no need to let anyone else know you are "on your own". It can be run as a spare time business for extra money. Or, as it grows to the point where it is paying more than your present salary, it can be expanded into a full time business—overnight. It can give you a sense of personal independence that will free you forever from the fear of lay-off, loss of job, depressions, or economic reverses.

Are You Mechanically Inclined?

While the operation of this business is partly automatic, it won't run itself. If you are to use it as a stepping stone to independence, you must be able to work with your hands, use such tools as hammer and screw driver, and enjoy getting into a pair of blue jeans and rolling up your sleeves. But two hours a day of manual work will keep your "factory" running 24 hours turning out a product that has a steady and ready sale in every community. A half dollar spent for raw materials can bring you six dollars in cash—six times a day.

In this message I'm not going to try to tell you the entire story. There is not enough space on this page. And, I am not going to ask you to spend a penny now to learn the secret. I'll send you all the information, free. If you are interested in becoming independent, in becoming your own boss, in knowing the sweet fruits of success as I know them, send me your name. That's all. Just your name. I won't ask you for a penny. I'll send you all the information about one of the most fascinating businesses you can imagine. With these facts, you will make your own investigation. You will check up on conditions in your neighborhood. You will weigh and analyze the whole proposition. Then, and then only, if you decide to take the next step, I'll allow you to invest $15.00. And even then, if you decide that your fifteen dollars has been badly invested I'll return it to you. Don't hesitate to send your name. I have no salesmen. I will merely write you a long letter and send you complete facts about the business I have found to be so successful. After that, you make the decisions.

Does Happiness Hang on Your Decision?

Don't put this off. It may be a coincidence that you are reading these words right now. Or, it may be a matter that is more deeply connected with your destiny than either of us can say. There is only one thing certain: If you have read this far you are interested in the kind of independence I enjoy. And if that is true, then you must take the next step. No coupon on this advertisement. If you don't think enough of your future happiness and prosperity to write your name on a postcard and mail it to me, forget the whole thing. But if you think there is a destiny that shapes men's lives, send your name now. What I send you may convince you of the truth of this proverb. And what I send you will not cost a penny, now or at any other time.

VICTOR B. MASON
1512 Jarvis Ave., Suite M3B
CHICAGO 26, ILLINOIS

WORLD'S GREATEST

CLASSIFIED

OPPORTUNITIES

Here are hundreds of opportunities offered especially to the readers of Popular Science Monthly. Read them. Answer them! You can make and save money.

POPULAR SCIENCE MONTHLY — 353 FOURTH AVE. — NEW YORK CITY 10

Classified Ads only $1.10 per word insertion, payable in advance. Minimum ad 10 words. To be included in April issue, copy should be in our office by February 21. No cancellations accepted after February 15. Address orders to O. K. Kelly, Classified Adv. Mgr.

1 AUTOMOBILES & MIDGET CARS

OLD copies of Popular Science wanted—any issue from period 1890 to 1915. Condition not too important provided books are complete with no pages removed. Write to Box No. 308, Tuckahoe, New York.

BOYS' Power-driven auto. Build your own. Plans 33 cents. Sypher Co., Sta. F., Toledo, Ohio.

NEW Catalog on Power Cams and Flywheels 25c. Weber Cams, Box 33175, Los Angeles 33, Calif.

CROSLEY And Foreign Car Owners Catalogues Available Parts Discount. Box 7, Elmont, New York.

HUNDREDS of automobile catalogs—old, new and foreign; dealer books, glossy photographs, shop manuals; free motor magazines listed by non-profit club. Write to get on free mailing list. Auto Maniacs, Inc., Stockbridge, Michigan.

2 AUTO SUPPLIES & EQUIPMENT

SAVE money on Jeep and army truck parts. Large inventory. Catalogs for Jeep and G.M.C. owners. American Auto Parts Co., 1830-PS Locust, Kansas City, Missouri.

AUTO Accessory and Parts Catalog, 1958 edition—all new! 229 pages. Save up to 50%—75,000 items, including Hollywood accessories, hi-speed equipment, rebuilt engines, all parts and accessories for all cars and trucks! Hard-to-get parts! Send 25c (refundable). J. C. Whitney, 1919 PS-2 Archer, Chicago 16, Illinois.

FREE Giant 1958 Parts Catalog. Thousands Scarce Accessories Stores Don't Have . . . Gadgets, Custom Equipment. Send 25c Postage (Refundable). Newhouse Automotive Industries, 5805-PS-2 Beverly, Los Angeles 23, Calif.

FORD A and T parts? Try best source old model parts, all makes. Wisniewski, Milwaukee 7, Wisconsin.

COMPLETE overhaul $3.95! 10,000 mile guarantee! Effess, 3017-S Moffat, Toledo 6, Ohio.

PUT Leap In Your Jeep, Henry-J, or Kaiser. V-8 Power. See Jeep Owners Ad. Page 86.

SEND Only One Dollar for Life Membership Registration. Receive With Your Membership Card Your Free Three Dollar Automotive Gift Now Being Sent to Present Members. Gane Economy Club, San Gabriel, California.

RECHROMING Kit for Automobiles. $2.98. Details. Fairmont Chemical, East Syracuse, New York.

FORD "T" Parts Headquarters. Free Catalog. Ernie Hemmings, Quincy, Illinois.

STOP Transmission Lubricant Loss With Easy-To-Install Davis Ball Boot. Protects Ball Housing and Drive Shaft Coupling; Prevents Wear on Metal Parts; Saves Expensive Repairs. For Chevrolets, 1941 Through 1954. All Models. All Transmissions. Write for Free Literature. Davis Ball Boot Company, Inc., 2305 Yale Street, Houston, Texas.

RING-Valve Job while driving, $6.00. Literature. Motaloy, Grantham 27, Pa.

RE-New Your Motor, Quickly. Save Expensive Motor Overhaul. Guaranteed. Motomagik, 21289 Tyee Street, Hayward, Calif.

USE THIS HANDY INDEX TO FIND WHAT YOU WANT

Advertising, Agencies for Advertisers ... 53
Agents Wanted ... 43
Air Conditioning ... 7A
Antiques, Relics & Indian Goods ... 29
Artists Supplies ... 76
Astronautics ... 5A
Authors Service ... 52
Auto Supplies & Equipment ... 2
Auto Trailers ... 3
Automobiles & Midget Cars ... 1
Aviation ... 5
Batteries, Generators, Etc. ... 6
Boats, Outboard Motors ... 11
Body-Building Courses, Jiu Jitsu, Etc. ... 12
Books & Magazines ... 23
Business Opportunities ... 37
Business Service, Information, Name Lists ... 50
Buy It Wholesale ... 38A
Cameras, Photo Supplies ... 34
Camping Equipment & Tents ... 16
Cartooning, Sign Painting, Chalk Talks ... 54
Chemistry & Physics ... 41
Coins & Currency ... 26
Color Photo Finishing ... 32A
Contests ... 46
Detectives ... 47
Do-It-Yourself ... 69
Dogs, Birds, Hamsters & Pets ... 17
Educational & Instruction ... 45
Electrical Supplies & Equipment ... 7
Enamels, Paints & Varnishes ... 64A
Engines, Motors, Etc. ... 10
Farms, Other Real Estate ... 19
Field Glasses, Telescopes ... 14
For Inventors ... 60
For Sale Miscellaneous ... 71
For the Home ... 69
Formulas, Plans, Etc. ... 39
Games & Entertainment ... 24A
Geiger Counters, Treasure Finders ... 77
Help Wanted ... 42
High-grade Salesmen ... 44
Hobbies, Collections ... 31
Home Craftsman ... 65
Hypnotism ... 24
Inventions Wanted ... 61
Language Outfits ... 48
Live Bait ... 18
Machinery, Tool Supplies, Etc. ... 9
Magic Tricks, Puzzles, Etc. ... 25
Manufacturing ... 63
Minerals & Precious Stones ... 30
Miscellaneous ... 79
Models, Model Supplies ... 64
Moneymaking Opportunities ... 38
Motion Pictures, Slides, Sound Equip. ... 33
Motorcycles, Bicycles & Supplies ... 4
Music, Song Writers & Records ... 35
Of Interest To Women ... 70
Old Gold, Jewelry, Watches ... 67
Old Stamps Wanted ... 27
Patent Attorneys ... 59
Patents For Sale ... 62
Personal ... 80
Photo Finishing, Photocopies, Etc. ... 32
Plastics ... 40
Plays, Stories, Etc. ... 49
Poultry & Supplies ... 21
Printing, Multigraphing, Etc. ... 57
Printing Outfits, Supplies ... 58
Profitable Occupations ... 2
Radio, TV, Supplies & Equipment ... 36
Razor Blades, Shavers ... 74
Rubber Stamps & Office Supplies ... 56
Special Services ... 51
Sporting Goods, Guns, Fishing Tackle, Etc. ... 15
Stamp Collecting ... 28
Tattooing Supplies ... 75
Tobacco & Pipes ... 68
Trees, Shrubs, Roots & Herbs ... 20
Trigonometers ... 9A
Typewriters & Office Machines ... 55
Wanted to Buy ... 72
Watch Repairing ... 78
Wearing Apparel ... 73
Welding, Soldering ... 8
Western Merchandise ... 79A

1939 TO 1954 Dodge-Plymouth Parts—Sheetmetal Moulding, 50% off List. Former Dodge-Plymouth Dealer. Write or Phone, Daniel Motors, Inc., 261 Wanaque Ave., Pompton Lks., N. J. Terhune 5-2800.

WONDERFUL New Paint Spray, Do it Yourself Kit. Hot Rods, Repair, Customize Your Car for Dimes. Sprays Anything. Lasts Lifetime. Guaranteed. Full Kit $3.95 Postpaid. Kits, 1047 Belvedere, North Vancouver, Canada.

AUTOMOTIVE Safety Equipment. Aim Company, 143 Verona Avenue, Newark 4, New Jersey.

GEN.-Exc. Generator Exciter. Keeps Generator Working Full Time. Eliminate Regulator And Battery Trouble. Write Scientific Electric Co., Box 12, Wickliffe, Ohio.

IF you have a product or service that can be operated on a mail order basis, write me today. I will send you a Free Kit on "How To Make Money Out Of Classified Advertising" Next issue will be April. Closing date February 21. Hurry—Do it Today! O. K. Kelly, Classified Adv., Mgr., Dept. 28, 353 Fourth Avenue, New York 10, N. Y.

3 AUTO TRAILERS

BUILD Expanding eight foot trailer. Accommodates five. Literature 10c. Framar Company, Wilmington, Massachusetts.

4 MOTORCYCLES, BICYCLES AND SUPPLIES

RECONDITIONED Motorcycles and motors. Chromium accessories. Complete stock Indian parts. Expert rebuilding. Fast service. Indian Motorcycle Sales, Kansas City 27, Missouri.

MIDGET car $10.00. Quarter midget $55.00. Doodlebug motorscooter $20.00, less engines. Engines $2.50 up. Whizzer $15.00. Servicycle $35.00. (Mailorder only). Send 25c (35c for first class mailing) for new Directory-Catalogue Number 81, listing these and hundreds of other bargains in new and used motorscooters, midget cars, homebuilders parts, plans, etc. Midget Motors Directory, Athens, Ohio.

NSU scooters and motorcycles. BMW motorcycles, 2 to 35 HP, shaftdrive and chaindrive. Butler & Smith, P.O.B. 45, New York 24.

SERVICYCLE $20.00; Whizzer Motorbike $25.00; Cushman motorscooter $25.00; midget auto $25.00. Rush 25c (35c first class mail) for new catalog #962 listing many other amazing bargains in motors, midget cars, motorscooters, motorbikes, construction plans. Associated, Box 534, Toledo, Ohio.

5 AVIATION

AVIATION Surplus Bargain Catalog. One Dime. Box 22PS3, Thomasville, Penn.

ANTI Gravity Research—Latest Notes $1.00. Also Included Centrifugal and Cyclic Propulsion Data. Helicopter Rams and Pulse Jet Engine Plans $1.00 Each. Decker Engine Works, Plasterco, Virginia.

GOVERNMENT Surplus, Aircraft and All Misc. Items. List and Procedures $1.00. Aviation, P.O. Box 259, Arcade Sta., Nashville, Tennessee.

GOVERNMENT Sells Surplus Aircrafts; Fuselages; Assemblies; Accessories; Engines; Instruments; Electronics; Misc., Buy Direct Now From U. S. Government. Depot List & Procedure $1.00. Brody, Box 8-PSA, Sunnyside 4, New York.

HOMEBUILT Helicopter Handbook, $1.00. Homebuilt Helicopter Directory $1.00. Urshan, Box 4332, N. P. Station, San Diego 4, California.

HOMEBUILT Helicopter Rotors. Picture, Specs., Prices 50c. Adams, Box 6042-C, Lakewood, Calif.

PROPELLERS, plans, supplies for airboats and snowplanes. Latest designs, prompt delivery. Catalog 25c. Banks-Maxwell, Box 3301G, Ft. Worth 5, Texas.

LEARN To Fly in a Flying Club. Flying Club Handbook—$1.00. National Flying Club, Box 94P, West Point, N. Y.

SMALL Helicopters Theory and Guide Manual. Drawings. Construction Data. $2.00. Sandhill Aircraft, Box 336, Atkinson, Nebraska.

7 ELECTRICAL SUPPLIES & EQUIPMENT

ELECTRIC Pencil: Engraves all Metals. $2.00. Beyer Mfg., 10511-C Springfield, Chicago 43.

LAMP parts Wholesale. Thousands of items for repairing, converting Catalog 25c. Brown Lamp, Box 305D, Clayton 5, Missouri.

MAGNETIZER—Magnetizes—Screwdrivers, etc. Only $1.00 Postpaid. Kubiak, Huntingdon Valley, Penna.

8 WELDING, SOLDERING

BUILD-Your-Own welder or welder and power combination. Low cost unit connected to used engine lets you weld anywhere. Free booklet tells how. Get into profitable welding business. Write Hobartweld, Box P-282, Troy, Ohio.

WELD, solder, cut, braze. ⅛" welder complete $7.95. Flame-torch $3.95. Postage 50c. 75 ampere transformer welder ½" $24.95 complete. F.O.B. Essay Mfg. Co., Quincy 69, Mass.

ACETYLENE Welding Outfits new $54.50; Arcwelders $56.50; Eagle Welding, Dept. 42, 5085 Broadway, Chicago 40, Ill.

WELDERS, 110/220. Welds ½". $39.50. Morris, 1070 Inner Drive, Schenectady, New York.

WELDERS Make Five Fast Selling Items. Complete Plans $1.00. Keith, 917 W. McAndrews, Medford, Oregon.

9 MACHINERY, TOOL SUPPLIES, ETC.

LIGHTWEIGHT, inexpensive, portable concrete mixer. Just patented. Free literature. Beran Manufacturing Company, 906 Dullnig, San Antonio 10, Texas.

PIPE Jaws for Your Machine Vise $1.75. ⅛ to 2". H. A. Johnson, 3921-A La Cresta Ave., Oakland, Cal.

NEW Surplus—H.S. Milling Cutters, Drills. Save to 90%. Sample Cutter $1.00. Dozen $6.60. Free List. Salme Enterprises, 40 Greendale Avenue, Worcester 6, Mass.

POWER Tools, not toys. Discounts. Factory catalogs. World Tool Supply, Box 4404, Joyfield Station, Detroit 28, Michigan.

OIL Drum Cement Mixer Assembly Kit. Circular. Nu-Way-Do Co., Newaygo, Michigan.

ALUMI-Steel Craft Tools $1.00. Machinist gages. Campbell Tools, 1424 Barclay, Springfield, Ohio.

FREE Power Tool Bargain List. Laircraft, Box S-5008, Detroit 35, Michigan.

9A TRIGONOMETERS

ENGINEERS, Draftsmen, Students: Triangulator Makes Trigonometry Easy. $1.00. No C.O.D. Trical, Box 67, Buffalo 15, New York.

10 ENGINES, MOTORS, ETC.

DIESEL Injector Parts Wanted GM51-71-110 Series. Mayer, 7120 Carnegie, Cleveland 3, Ohio.

FACTS, engineering data, miniature glowing and diesel engines. European, Japanese. Illustrated booklet 40c. Box 136, Cincinnati 42, Ohio.

REWIND Motors yourself. Complete instructions $1.00. Lewis Mfg., Howell 11, Michigan.

FREE Catalog. Clutches, Engines, Motorbikes, Mowers, Kits. Loren Products, Danville, Illinois.

11 BOATS, OUTBOARD MOTORS

NEW used, rebuilt marine motors. Marine conversions, fittings. Free Catalog. Stokes Marine Supply, Dept. 23, Coldwater, Mich.

FIBERGLASS your boat! Wholesale prices. Send for information, sample. Aqua Glas, Box 442, Altadena, Calif.

FREE big catalog; Boat Kits save ⅓ to 2/3 "factory built" prices. 8' through 13' outboards designed for amateur assembly. Trailers, Fiberglas, Hardware, Accessories. Luger, Dept. K-2, 9200 Access Rd., Minneapolis 20, Minnesota.

SAVE Money. New, used outboard motor parts. Send wants. Stamp appreciated. Outboard Motor Mart, 229-S State, Boston 9, Massachusetts.

MARINE conversions. Ford, Chevrolet V8, Jeep engines. Catalog 25c. Lehman Manufacturing Co., 972A Broad St., Newark 2, N.J.

FULL size, cut-to-shape boat patterns, blueprints. 7½-38 feet. Big new 88 pg. illustrated "Build a Boat" Catalog of Naval architect-designed Cruisers, Runabouts, Skiffs, Outboard Boats, Sailing, Racing, Houseboats, 50c. "How to Build a Boat" Booklet, $2.50. Hardware & Equipment Catalog $2.00. Cleveland Boat Blueprint Co., Dept. A-77, Box 1651, Cleveland, Ohio.

BUILD aluminum ski boat. Complete plans $2.00. 1534 N.W. 32nd, Oklahoma City.

BOAT Plans—Full Size Patterns—Frame Kits. Modern Inboards and Outboards for amateur builders. Complete New Catalog 50c or specify requirements. Glen Marine, 9152 Rosecrans, Bellflower, Calif.

BOAT—Motor Combinations: Plywood $135.00! Molded Lapstrake, $205.00! 260 Powerboat Plans Catalog, 50c. Marinecraft, Box 161-P, Brighton, Mass.

12 BODY-BUILDING COURSES, JIU JITSU & ATHLETIC EQUIPMENT

BUILD powerful arms, chest, shoulders! 22 exercises, $1. Fonsad, Box 601-C, 1100 Market, Wilmington 99, Delaware.

OUTSTANDING Physical Development! Any age. New Guaranteed Discovery. Uses Only A Rope! Strength, Health, Muscles. Gain-Reduce. Free Details. Ropercise, 4834-B Art, San Diego 15, California.

HOW to Build Mighty Muscles for All the Body. Fully Illustrated Course 50c. Jorgensen, P.O. Box 1450-M-1, Seattle 3, Wash.

KARATE, Deadly Oriental Defense, Enlarged Edition. Self Taught in Pictures. $2.98. Jim Lee, P. O. Box 245, Oakland 4, Calif.

BE Taller! Coach's "Inch-At-A-Time" System, $1.00 Complete. Satisfaction Guaranteed. Marty Snyder, Box 195-HB, Union City, New Jersey.

PUSHED around? Don't take nonsense from bullies. Give them the shock of their lives. Easy when you know Police Jiu Jitsu. Complete fully illustrated course in one volume as taught police and armed forces. Send $1 now. Money back guarantee. Books Publishing Co., Amityville 39, N. Y.

BARBELLS, Body Building equipment. Courses. Free Catalog. Reading Barbell Co., Reading, Pennsylvania.

BARBELLS, Dumbbells, Exercise equipment. Courses. Free booklet. Good Barbell Co., Siloam Springs, Ark.

BOXERS Heavy Striking Bag—For the Home Gym, Schools, Clubs, Etc. 12" x 36", 10 oz. Canvas Unstuffed Complete With Chains, Hooks, Formerly $10.95. Sale $6.75 P.P. No C.O.D. Heff Co., P. O. Box 236, Williamsport, Pa.

14 FIELD GLASSES, TELESCOPES

MICROSCOPE Catalog Free. Research Scientific Supplies, 126 West 23rd Street, New York 11, N.Y.

DYNASCOPE—Sensational New Reflector Telescope. Send for details. Criterion Company, Dept. DS-46, Hartford, Connecticut.

FREE Catalogue! Thousands war surplus optical bargains. Lenses, Prisms, Telescopes, Binoculars, etc. Send $1.00 for 10 Lens Hobbyist Set and Project booklet. G. Jaegers, 691 West Merrick Road, Lynbrook, New York.

REFLECTOR Telescope Kits $7.25 (3") to $175.00 (12"). Mirrors, Cells, Focusing Mounts, Tripods, Eye Systems. Anything, everything in telescopes. Free Catalog. Also Ready to use telescopes from $25.00. Esco Products, Oakridge, New Jersey.

MIDWINTER sale, sacrifice prices precision binoculars. Folder. "Binocular Selecting" catalog free. Precision Importers, Mercury Bldg., West Los Angeles 25, Calif.

BINOCULARS, telescopes, microscopes. Terrific values $1.98 up. Request free money-saving catalog. Criterion, Dept. G-63, Hartford, Connecticut.

WAR Surplus bargains! Millions of lenses, instruments, telescopes, binoculars, components and complete line of astronomical telescope items. World's greatest optical market place! Send only $1.00 for beginner's 10-lens kit and big instruction booklet Stock 2-CN. Write for catalog-CN Free. Edmund Scientific Co., Barrington, New Jersey.

MAKE 6" Telescope reflector. Glass, abrasives, instructions—$12.00. F. Cameron, Box 65, Inwood 96, New York.

ASTRONOMICAL Books, Star-Atlases, free list. Herbert Luft, 69-11 229th Street, Bayside 64, New York.

BUILD your own Reflector Telescope. Complete kit: Mirror, Eyepieces, Tripod, all other accessories. Request free illustrated literature. Criterion Manufacturing, Dept. KP-40, Hartford, Connecticut.

REFLECTING Telescope completely assembled. 60X. $29.75. Guaranteed Observatory clearness. Free information. Skyscope, 475 Fifth Avenue, New York 17.

REFRACTOR and reflector telescopes. Also mirrors, lenses, tripods, etc., for making your own telescopes. Free illustrated catalog. Suffolk Science, Mattituck, N. Y.

15 SPORTING GOODS, GUNS, FISHING TACKLE, ARCHERY, TRAPPING

FREE—Giant 1957 Wholesale Sporting Goods Catalog. Lowest wholesale prices. Complete line of cameras, sporting goods, appliances, outdoor items. Write today, Santa Fe Distributing Co., 1321 Main St., Dept. PS, Kansas City, Missouri.

HOW To Catch Fish With Smell. Secret Recipes, Formulas, Methods, 25c. Jacksons, 312 Lake Avenue, Ithaca, New York.

LUGERS! Mausers! Colts! P-38s! Kentuckies! Weatherbys! Antique — Modern Guns, Guncessories! Super Bargain Catalog only 50c. Agramonte's, Yonkers 2A, N. Y.

FREE Catalog. Newest items. Bargains. Gadgets, Beads, Spinners, Lure parts, Sinker molds. Finnysports PD, Toledo 6, Ohio.

FREE Below Wholesale fishing catalog. Fishing Tackle Mart, Dept. 612, Box 6737, Chicago 80, Ill.

100,000 PRODUCTS Wholesale — Free catalog! Send postcard: Econ-O-Mart, Whippany 16, New Jersey.

AMAZING patented combination poolcue lock, hanger-straightener. $2.50. Herman Morgan, 415 H, Lawton, Oklahoma.

5,000 BARGAINS, firearms, binoculars, war relics, catalog 50c. Smith Museum, Runnemede, N. J.

WOOLYWORMS, finest spinfishing lure 10—$1.00. Description free. Park Products, 47th, New Brighton, Pa.

NYLON Rope, Lines, Cords. Every Description for all Household and Sportsmen's Uses. Finest Made. Free Catalog. Beebe Cordage Co., Cranford 7, New Jersey.

JAP rifles altering American shells $6.00. Jap shells $3.95, catalog 5c. TP Shop, West Branch 10, Michigan.

16 CAMPING EQUIPMENT & TENTS

TENTS, direct from manufacturer; world's largest selection. Low prices. Send 25c (print name-address) for 160 page complete catalogue of Tents, Camping Equipment, National Camp Sites guide & Camping handbook Morsan, 10-15G 50th Avenue, Long Island City 1, New York.

17 DOGS, BIRDS, HAMSTERS, RABBITS & PETS

RAISE Mink. Free booklet, pen plans, inside "secrets," feed, care. Mink are money makers. Investigate today. Lawrence Molgard, Brigham City 13, Utah.

RAISE Rabbits or Mink on $500 month plan. Free details. White's Rabbitry, Delaware, Ohio.

HAMSTERS—Golden: Young $3.00 pair, breeders, $4.00 pair. New mutation, $3.00 pair. Adirondack Hamstery, Prospect 13-B, New York.

BRED red squirrels, chipmunks, fliers. Balch Squirrel Farm, Castleton, Vt.

RAISE Rabbits For Us—Profitable Angoras, Chinchillas, New Zealands. Particulars Free. Grinsteads, Edwardsville, Illinois.

WE Pay $3.50 lb. dried. Grow Mushrooms. Cellar, shed and outdoors. Spare full time, year round. We have 25,000 customers. Free Book. Washington Mushroom Ind., Dept. 111, 2934 Admiral Way, Seattle, Wash.

HAMSTERS—Ideal Pets. $2.95 pair. Free Booklet. Jer-Fre's Hamstery, 2425 Hoyt, Muskegon Heights 14, Michigan.

MAKE Big Money Raising Nutria, Chinchillas, Cavies, Mink, Rabbits, or Pigeons for us. Free information. Keeney Brothers, New Freedom, Pennsylvania.

LIVE Alligators $2.50 Postpaid. "Gators," Box 7241, Miami 55, Fla.

18 EARTHWORMS & FROGS

$10,000 YEAR possible, earthworms. 32 Page booklet tells how 35c. Missouri Earthworm Research, Box C-6851, Kansas City, Missouri.

RAISE Nightcrawlers, Redworms, Soilless Method. Three Oaks Ranch, Dresden, Tenn.

$1,000. MONTHLY Possible, Raising Earthworms. African Giants! Backyard, Garage, Basement. Complete Illustrated Booklet, Explains Raising, Feeding, Packing, Marketing. Only 25c! Ozark Worm Farm-V, Willow Springs, Missouri.

19 FARMS, OTHER REAL ESTATE

FLORIDA—Nice homesites, $345 at $10 monthly. Folder Free. Winfree Vernor, DeLand, Florida.

FLORIDA Waterfront Homesites, moderate priced for retirement. Monthly payments. Good fishing, hunting. Adjoins Ocala National Forest. Grace Parker, Paisley, Lake County, Florida.

CANADIAN Tax Sale Lands for three dollars an acre and up. Small monthly payments. Farms, timber, hunting and fishing camps, minerals. Limited number of properties. Write at once for free catalogue. Tax Sale Service, Room 113, 120 Bloor St., W., Toronto 5, Canada.

FLORIDA Trailer Homesites. Water System. $495.00, $10.00 Monthly. Lake Privileges. Box 2005, Deland, Florida.

NEW Strout Spring Catalog just out! Mailed Free! Over 3100 bargains, 34 states, coast-to-coast. Farms, homes, businesses. World's largest. 58 year's service. Strout Realty, 251-ZB 4th Ave., New York 10, N. Y.

SUMMER cabin sites, inside Glacier Park Level, trees, accessible 50x98 excellent title $200 down & monthly. Free folder. Charles Green, Coram, Montana.

FLORIDA—2½ acres; $15 down, $15 monthly; full price—$695.00. High elevation, near Gulf of Mexico. Suitable Farming, citrus, poultry. Free information. Florida Sunshine Coast Development Co., Brooksville, Florida. Dept. PS-2.

FLORIDA'S Most Desirable Secluded Fishing and Hunting Homesites in New Lake Center Development. Surrounded by Lakes. In Famous Panama City Gulf Resort Area. Ideal for Sportsman's and Family Vacations. Only $10 Monthly. Booklet Free. Douglas Wood, Fountain, Florida.

TEXAS Cabin sites. 5 clear mammoth Lakes. Finest fishing, hunting. Good roads, electricity. Developing fast. Private boat dock, fishing pier, barbecue pits, tables, and picnic grounds Free to lot owners. Ideal for retirement or recreation. Near 3 thriving towns. Everything you could wish for Two (2) adjoining lots total cost for both only $145.00. $10.00 down, $10.00 month. Write for maps, photos, etc. Dept. GS-11, P.O. Box 50, Kingsland, Texas.

RETIRE In California on $200 Month; Seashore or Desert. Thriving Communities, Healthful Climates, Beautiful Scenery. Good Investment Opportunities. Mail $1.00 for Pictures, Complete Information. Wheeler, Box 405, Hesperia, California.

20 TREES, SHRUBS, ROOTS, HERBS

RAISE Your shrubs, trees from seed. Free planting guide, price list. Woodlot Seed Co., Norway 46, Michigan.

EVERGREENS! 2-year plants well-rooted. Assorted pine and spruce. Shipped postpaid at planting time; money-back guarantee. 10 for $2; 25 for $4; 50 for $6; 100 for $10. Willowcrest Nurseries, 5727 Grubb Rd., Erie, Pa.

22 PROFITABLE OCCUPATIONS

$5000 FROM Half Acre growing Ginseng, crop bought. Particulars 10c. Associated Growers, Sperling, Manitoba.

FREE Folder, "How To Make $3,000 Yearly Sparetime, Backyard, Raising Earthworms!" Oakhaven-7, Cedar Hill, Texas.

$6,000 FOR Mister, Mrs.; $3,500! Free "Secret Journal" Plan. Magical! Work home! Publico-N44, Oceanside, Calif.

SAVE Money! Buy Wholesale! Free Catalog General Merchandise. Norris, 487-H Broadway, New York.

BIG Profits in Welding. Easy to learn. Low cost training in completely equipped Non-Profit school. GI Approved. Write for Free Booklet—Hobart Trade School, Box P-283, Troy, Ohio.

INVESTIGATE Accidents—Earn $750 to $1,000 month. Thousands of airlines, insurance companies, steamship lines urgently need claim investigators. We train you home spare time. Placement counsel and help. Free book—Now! No obligation. Universal Schools, B2, Box 8202, Dallas 5, Texas.

VENDING Machines—No Selling. Operate A Route of Coin Machines And Earn Amazing Profits. 32-Page Catalog Free. Parkway Machine Corporation, Dept. 17, 715 Ensor Street, Baltimore 2, Maryland.

FREE Book "505 Odd, Successful Businesses." Work home! Pacific—37C, Oceanside, Calif.

VENTURE financing. A pocket guide to modern methods of financing small business. Useful to business men, bankers, lawyers and accountants. Send $1.00 (refundable). Business Publications, 526 1st Ave. North, Seattle 9, Washington.

FREE Literature—Make Big Money Raising Fishworms and Crickets. Carter Farm-10, Plains, Ga.

$60.00 WEEKLY, sparetime—easy! Home Venetian Blind Laundry. Free Book. Burtt, 2434EX, Wichita 13, Kansas.

LEARN Invisible Reweaving At Home. Free Details. Jack's Service, P.O. Box 3451, Freeport, Illinois.

PRECISION Sharpen Scissors, Snips, Pinkers. Using inexpensive outfit. Blackhawk, Sheldahl, Iowa.

WE Pay $3.50 lb. dried. Grow Mushrooms. Cellar, shed and outdoors. Spare, full time, year round. We have 25,000 customers. Free Book. Washington Mushroom Ind., Dept. 101, 2954 Admiral Way, Seattle, Wash.

FREE Book "990 Successful, Little-Known Businesses." Work home. Plymouth, 1610-A 43rd Street, Brooklyn 4, New York.

HOUSEWIVES, Others. $30-$100 Weekly Asembling Pre-Polished Rockhound Jewelry at Home Spare Time. Free Details. Viking, Dept. 31, Box 2066, Inglewood, Calif.

WHOLESALE! Thousands Name Brand Products; Free Catalogs! United Wholesalers, 1265T Broadway, New York 1, N.Y.

$30-$60 WEEKLY addressing envelopes. Instructions $1, refundable. Reiss, 210 Fifth Ave., Suite 1102-S, New York 10.

BUY Wholesale! Over 10,000 Nationally Advertised Products, Appliances, Cameras, Sporting Goods, Housewares, Watches, Typewriters, Tools, Clothing, etc. Send Postcard Today. Buy-Rite, Box 258, Hawthorne 7, New Jersey.

FREE "$5,000-$45,000; Unlimited Vacations." Work home! No merchandise, equipment! Haylings-PS, Carlsbad, Calif.

23 BOOKS & MAGAZINES

BRITISH Book Bargains. Any subject. Catalog free. Transbooks, Box 1-PSZ, Wantagh, New York.

GOOD Used Books, 50c-$1. Free Lists. Editions, Dept. PS, Hempstead, New York.

WE want to buy old copies of Popular Science—any issue from period 1890 to 1915. Condition not too important provided books are complete with no pages removed. Write to Box No. 308, Tuckahoe, New York.

SPECIAL 30c—32 Page booklet—"Your Aquarium" for 15c. Innes Publ. Co., 12th and Cherry Sts., Philadelphia 7, Pennsylvania.

NATIONAL Geographic Magazines 1888-1952. Any issue. Periodical Service, Box 465-PS, Wilmington, Delaware.

DISPOSAL Sale. New-used books. List free. Extra Special: 10 books including 4 giant novels $1.00 only. Perell, 436 N. Y. Ave., Brooklyn 25, N. Y.

BOOKHUNTERS: All Subjects. Send Wants! Jaher Book Service, 183 Hazelwood Drive, Westbury, New York.

FREE Copy! "Handbook: Useful Tables." Franks, 3121 South Racine, Chicago 8.

FREE Book Catalog. Many Interesting Subjects. Books Publishing Co., Amityville 39, N. Y.

"WHAT A Male Teenager Should Know." 35c. Nalloh Enterprises, Box 7183, New Orleans 19, La.

ATHEIST Books. Catalogue free. Truth Seeker Co., 38 Park Row, New York 8.

JOHN Friend, Bookfinder, can get the books you want. Free Search Service. Box 2570PS, Long Beach 1, California.

24 HYPNOTISM

FREE Illustrated Hypnotism, Selfhypnosis Catalogue. Write: Hypnotist, 8721 Sunset, Hollywood 46P, California.

BEGINNER'S Hypnosis . . . illustrated . . . $1.00 Moneyback Guarantee. Baltimore School of Hypnotism, Dept. 82C, Box 6229, Baltimore 6, Maryland.

HYPNOTIZE Successfully! Learn Easy, Fast, Modern Methods. Complete, Illustrated Course, including self-hypnosis and "Secret Nerve Pressure Technique" (Guaranteed Harmless)—$1.00. H. Fowler, 850 Draper Ave., Schenectady 6, New York.

ARE you eating yourself to death? Hypnotically helpful record teaches fatless diet. $1.00. B. Grauer, 210 Fifth Avenue, New York 10.

FREE Catalog! Hypnotism, Autohypnosis! Books, Tapes, Records! Drawer PS697, Ruidoso, New Mexico.

LEARN Hypnotism—our book 25 lessons in Hypnotism shows how to achieve business and social success. $1 postpaid. Satisfaction guaranteed. Books Publishing Co., Amityville 29, New York.

EX-Ray Mind! Hypnotize, one glance. Guaranteed. $3.00. Wamsteker, Box 10, Ottery, Cape, South Africa.

TELEVISION Hypnotist Emile Franchel offers comprehensive home study course hypnotism and autosuggestion for self-improvement. Examinations and certificate. No gadgets—no extras. 6134 Woodman, Van Nuys, California.

"HYPNOTIZE . . . One word . . . One fingersnap," on stage. Satisfaction—or refund . . . $2.00. "Self-hypnosis. Limb-by-limb Technique." $2. Hypnomaster, 846-H6 Sunnyside, Chicago 40.

24A GAMES & ENTERTAINMENT

USED juke boxes, pool games $100. Hit records 30c. Catalog free. Wickens, 1139-W Summer, Appleton, Wis.

25 MAGIC TRICKS, PUZZLES, ETC.

WORLD'S finest professional magic. Joker novelties. Giant illustrated catalog 10c. Top Hat, Evanston 13, Illinois.

3100 NOVELTIES, Jokes, Tricks, Gadgets, Funmakers, Hobbies. Big catalog 10c. Johnson-Smith, D-423, Detroit 7.

ONLY 10c brings you magic's greatest value, Douglas famous Catalog, 500 Tricks. Tricks for amateur and professional, for pocket, parlor, club, stage, with balls, coins, cards, cigarettes, silks, apparatus. Fastest service to magicians everywhere for over 30 years. Amaze your friends, send 10c today. Douglas Magicland, Dept. 20, Dallas, Texas.

GAMBLERS winning, cheating, exposed. Book $1.00. Catalog 10c. Book, Box 671, St. Louis 1, Missouri.

STINKBOMBS. Disgustingly potent! 12/$1. Kits, 1452-G Drake, San Pablo 10, Calif.

"VENTRILLO" Professional Voice Thrower and Catalog 25c! Box 971-PS, Philadelphia 5.

SENSATIONAL Magician's Wand (Vanishes Handkerchief!) 25c, catalog included. Box 1352-PS, Philadelphia 5.

SMOKEBOMBS 25c, 7 for $1.00. (Terrific!) 4463-PS Greene, Philadelphia 44.

DOLLAR Magic Set Free with Catalog 25c. 4462-PS Germantown, Philadelphia.

WHOLESALE! Thirty 10c Trick Novelties $1.00! (Profits!) 1746-SW Market, Philadelphia 3.

279 MAGICIANS Secrets, Vanishing Cards, Magic Catalog, all for 25c. Ward's, Box 391, Jackson Heights 72, New York.

STINKBOMBS. Potent Aroma! 12/$1. Kits, 1452 Drake, San Pablo, Cal.

HINDOO Rope Mystery and Catalog 25c. Hocus Pocus, 317 North State, Jackson, Mississippi.

"102 STARTLING Tricks" Plus completely illustrated catalog 50c. Stowell's, Woodstock, New York.

26 COINS & CURRENCY

GET Profit and Pleasure in collecting old coins. Send 10c for 56-page illustrated coin catalog. You'll be delighted with it. Send for it now. B. Max Mehl, 374 Mehl Building, Fort Worth, Texas. Largest rare coin establishment in U. S. Established 58 years.

HOMEBUILT Helicopter Handbook, $1.00. Homebuilt Helicopter Directory $1.00. Urshan, Box 4332, N. P. Station, San Diego 4, California.

HOMEBUILT Helicopter Rotors. Picture, Specs., Prices 50c. Adams, Box 6042-C, Lakewood, Calif.

PROPELLERS, plans, supplies for airboats and snowplanes. Latest designs, prompt delivery. Catalog 25c. Banks-Maxwell, Box 3301G, Ft. Worth 5, Texas.

LEARN To Fly in a Flying Club. Flying Club Handbook—$1.00. National Flying Club, Box 94P, West Point, N. Y.

SMALL Helicopters Theory and Guide Manual. Drawings, Construction Data. $2.00. Sandhill Aircraft, Box 336, Atkinson, Nebraska.

7 ELECTRICAL SUPPLIES & EQUIPMENT

ELECTRIC Pencil: Engraves all Metals. $2.00. Beyer Mfg., 10511-C Springfield, Chicago 43.

LAMP parts Wholesale. Thousands of Items for repairing, converting Catalog 25c. Brown Lamp Box 305D, Clayton 5, Missouri.

MAGNETIZER—Magnetizes—Screwdrivers, etc. Only $1.00 Postpaid. Kubiak, Huntingdon Valley, Penna.

8 WELDING, SOLDERING

BUILD-Your-Own welder or welder and power combination. Low cost unit connected to used engine lets you weld anywhere. Free booklet tells how. Get into profitable welding business. Write Hobartweld, Box P-282, Troy, Ohio.

WELD, solder, cut, braze. 1/8" welder complete $7.95. Flame-torch $3.95. Postage 50c. 75 ampere transformer welder 1/2" $24.95 complete. F.O.B. Essay Mfg. Co., Quincy 69, Mass.

ACETYLENE Welding Outfits new $54.50; Arcwelders $56.50; Eagle Welding, Dept. 42, 5085 Broadway, Chicago 40, Ill.

WELDERS, 110/220. Welds 1/8". $39.50. Morris, 1070 Inner Drive, Schenectady, New York.

WELDERS Make Five Fast Selling Items. Complete Plans $1.00. Keith, 917 W. McAndrews, Medford, Oregon.

9 MACHINERY, TOOL SUPPLIES, ETC.

LIGHTWEIGHT, inexpensive, portable concrete mixer. Just patented. Free literature. Beran Manufacturing Company, 906 Dullnig, San Antonio 10, Texas.

PIPE Jaws for Your Machine Vise $1.75. 1/8 to 2". H. A. Johnson, 3921-A La Cresta Ave., Oakland, Cal.

NEW Surplus—H.S. Milling Cutters, Drills. Save to 90%. Sample Cutter $1.00. Dozen $6.60. Free List. Salme Enterprises, 40 Greendale Avenue, Worcester 6, Mass.

POWER Tools, not toys. Discounts. Factory catalogs. World Tool Supply, Box 4404, Joyfield Station, Detroit 28, Michigan.

OIL Drum Cement Mixer Assembly Kit. Circular. Nu-Way-Do Co., Newaygo, Michigan.

ALUMI-Steel Craft Tools $1.00. Machinist gages. Campbell Tools, 1424 Barclay, Springfield, Ohio.

FREE Power Tool Bargain List. Laircraft, Box S-5008, Detroit 35, Michigan.

9A TRIGONOMETERS

ENGINEERS, Draftsmen, Students: Triangulator Makes Trigonometry Easy. $1.00. No C.O.D. Trical, Box 67, Buffalo 13, New York.

10 ENGINES, MOTORS, ETC.

DIESEL Injector Parts Wanted GM51-71-110 Series. Mayer, 7120 Carnegie, Cleveland 3, Ohio.

FACTS, engineering data, miniature gloplug and diesel engines. European, Japanese. Illustrated booklet 40c. Box 136, Cincinnati 42, Ohio.

REWIND Motors yourself. Complete instructions $1.00. Lewis Mfg., Howell 11, Michigan.

FREE Catalog. Clutches, Engines, Motorbikes, Mowers, Kits. Loren Products, Danville, Illinois.

11 BOATS, OUTBOARD MOTORS

NEW used, rebuilt marine motors. Marine conversions, fittings. Free Catalog. Stokes Marine Supply, Dept. 23, Coldwater, Mich.

FIBERGLASS your boat! Wholesale prices. Send for information, sample. Aqua Glas, Box 442, Altadena, Calif.

FREE big catalog; Boat Kits save 1/2 to 2/3 "factory built" prices. 8' through 13' outboards designed for amateur assembly. Trailers, Fiberglas, Hardware, Accessories. Luger, Dept. K-2, 9200 Access Rd., Minneapolis 20, Minnesota.

SAVE Money. New, used outboard motor parts. Send wants. Stamp appreciated. Outboard Motor Mart, 229-S State, Boston 9, Massachusetts.

MARINE conversions. Ford, Chevrolet V8, Jeep engines. Catalog 25c. Lehman Manufacturing Co., 972A Broad St., Newark 2, N.J.

FULL size, cut-to-shape boat patterns, blueprints, 7 1/2-38 feet. Big new 88 pg. illustrated "Build a Boat" Catalog of Naval architect-designed Cruisers, Runabouts, Skiffs, Outboard Boats, Sailing, Racing, Houseboats, 50c. "How to Build a Boat" Booklet, $2.50. Hardware & Equipment Catalog $2.00. Cleveland Boat Blueprint Co., Dept. A-77, Box 1651, Cleveland, Ohio.

BUILD aluminum ski boat. Complete plans $2.00. 1534 N.W. 32nd, Oklahoma City.

BOAT Plans—Full Size Patterns—Frame Kits. Modern Inboards and Outboards for amateur builders. Complete New Catalog 50c or specify requirements. Glen Marine, 9152 Rosecrans, Bellflower, Calif.

BOAT—Motor Combinations: Plywood $135.00! Molded Lapstrake, $205.00! 260 Powerboat Plans Catalog, 50c. Marinecraft, Box 161-P, Brighton, Mass.

12 BODY-BUILDING COURSES, JIU JITSU & ATHLETIC EQUIPMENT

BUILD powerful arms, chest, shoulders! 23 exercises, $1. Fonsad, Box 601-C, 1100 Market, Wilmington 99, Delaware.

OUTSTANDING Physical Development! Any age. New Guaranteed Discovery Uses Only A Rope! Strength, Health, Muscles. Gain-Reduce. Free Details, Repercise. 4834-B Art, San Diego 15, California.

HOW to Build Mighty Muscles for All the Body. Fully Illustrated Course 50c. Jorgensen, P.O. Box 1450-M-1, Seattle 3, Wash.

KARATE, Deadly Oriental Defense. Enlarged Edition. Self Taught in Pictures. $2.98. Jim Lee, P. O. Box 245, Oakland 4, Calif.

BE Taller! Coach's "Inch-At-A-Time" System, $1.00 Complete. Satisfaction Guaranteed. Marty Snyder, Box 195-HB, Union City, New Jersey.

PUSHED around? Don't take nonsense from bullies. Give them the shock of their lives. Easy when you know Police Jiu Jitsu. Complete fully illustrated course in one volume as taught police and armed forces. Send $1 now. Money back guarantee. Books Publishing Co., Amityville 39, N. Y.

BARBELLS, Body Building equipment. Courses. Free Catalog. Reading Barbell Co., Reading, Pennsylvania.

BARBELLS, Dumbbells, Exercise equipment Courses. Free booklet. Good Barbell Co., Siloam Springs, Ark.

BOXERS Heavy Striking Bag—For the Home Gym, Schools, Clubs, Etc. 12" x 36", 10 oz. Canvas Unstuffed Complete With Chains, Hooks, Formerly $10.95, Sale $6.75 P.P. No C.O.D. Heff Co., P. O. Box 236, Williamsport, Pa.

14 FIELD GLASSES, TELESCOPES

MICROSCOPE Catalog Free. Research Scientific Supplies, 126 West 23rd Street, New York 11, N.Y.

DYNASCOPE—Sensational New Reflector Telescope. Send for details. Criterion Company, Dept. DS-46, Hartford, Connecticut.

FREE Catalogue! Thousands war surplus optical bargains. Lenses, Prisms, Telescopes, Binoculars, etc. Send $1.00 for 10 Lens Hobbyist Set and Project booklet. G. Jaegers, 691 West Merrick Road, Lynbrook, New York.

REFLECTOR Telescope Kits $7.25 (3") to $175.00 (12"). Mirrors, Cells, Focusing Mounts, Tripods, Eye Systems. Anything, everything in telescopes. Free Catalog. Also Ready to use telescopes from $25.00. Esco Products, Oakridge, New Jersey.

MIDWINTER sale, sacrifice prices precision binoculars. Folder, "Binocular Selecting," catalog free. Prentiss Importers, Mercury Bldg., West Los Angeles 25, Calif.

BINOCULARS, telescopes, microscopes. Terrific values $3.98 up. Request free money-saving catalog. Criterion, Dept. S-63, Hartford, Connecticut.

WAR Surplus bargains! Millions of lenses, instruments, telescopes, binoculars, components and complete line of astronomical telescope items. World's greatest optical market place! Send only $1.00 for beginner's 10-lens kit and big instruction booklet Stock 2-CN. Write for catalog-CN Free. Edmund Scientific Co., Barrington, New Jersey.

MAKE 6" Telescope reflector. Glass, abrasives, instructions—$12.00. F. Cameron, Box 65, Inwood 96, New York.

ASTRONOMICAL Books, Star-Atlases, free list. Herbert Luft, 69-11 229th Street, Bayside 64, New York.

BUILD your own Reflector Telescope. Complete kit: Mirror, Eyepieces, Tripod, all other accessories. Request free illustrated literature. Criterion Manufacturing, Dept. KP-40, Hartford, Connecticut.

REFLECTING Telescope completely assembled. 60X. $29.75. Guaranteed Observatory clearness. Free information. Skyscope, 475 Fifth Avenue, New York 17.

REFRACTOR and reflector telescopes. Also mirrors, lenses, tripods, etc., for making your own telescopes. Free illustrated catalog. Suffolk Science, Mattituck, N. Y.

15 SPORTING GOODS, GUNS, FISHING TACKLE, ARCHERY, TRAPPING

FREE—Giant 1957 Wholesale Sporting Goods Catalog. Lowest wholesale prices. Complete line of cameras, sporting goods, appliances, outdoor items. Write today, Santa Fe Distributing Co., 1321 Main St., Dept. PS, Kansas City, Missouri.

HOW To Catch Fish With Smell. Secret Recipes, Formulas, Methods, 25c. Jacksons, 312 Lake Avenue, Ithaca, New York.

LUGERS! Mausers! Colts! P-38s! Kentuckies! Weatherbys! Antique — Modern Guns, Guncessories! Super Bargain Catalog only 50c. Agramonte's, Yonkers 2A, N. Y.

FREE Catalog. Newest items. Bargains. Gadgets, Beads, Spinners, Lure parts, Sinker molds. Finnysports PD, Toledo 6, Ohio.

FREE Below Wholesale fishing catalog. Fishing Tackle Mart, Dept. 612, Box 6737, Chicago 80, Ill.

100,000 PRODUCTS Wholesale — Free catalog! Send postcard: Econ-O-Mart, Whippany 16, New Jersey.

AMAZING patented combination poolcue lock, hanger-straightener. $2.50. Herman Morgan, 415 H, Lawton, Oklahoma.

5,000 BARGAINS, firearms, binoculars, war relics, catalog 50c. Smith Museum, Runnemede, N. J.

WOOLYWORMS, finest spinfishing lure 10—$1.00. Description free. Park Products, 47th, New Brighton, Pa.

NYLON Rope, Lines, Cords. Every Description for all Household and Sportsmen's Uses. Finest Made. Free Catalog. Beebe Cordage Co., Cranford 7, New Jersey.

JAP rifles altering. American shells $6.00. Jap shells $3.95, catalog 5c. TP Shop, West Branch 10, Michigan.

16 CAMPING EQUIPMENT & TENTS

TENTS, direct from manufacturer; world's largest selection. Low prices. Send 25c (print name-address) for 160 page complete catalogue of Tents, Camping Equipment, National Camp Sites guide & Camping handbook. Morsan, 10-15G 50th Avenue, Long Island City 1, New York.

17 DOGS, BIRDS, HAMSTERS, RABBITS & PETS

RAISE Mink: Free booklet, pen plans, inside "secrets," feed, care. Mink are money makers. Investigate today. Lawrence Molgard, Brigham City 13, Utah.

RAISE Rabbits or Mink on $500 month plan. Free details. White's Rabbitry, Delaware, Ohio.

HAMSTERS—Golden: Young, $3.00 pair, breeders, $4.00 pair. New mutation, $5.00 pair. Adirondack Hamstery, Prospect 13-B, New York.

BRED red squirrels, chipmunks, fliers. Balch Squirrel Farm, Castleton, Vt.

RAISE Rabbits For Us—Profitable Angoras, Chinchillas, New Zealands. Particulars Free. Grinsteads, Edwardsville, Illinois.

WE Pay $3.50 lb. dried. Grow Mushrooms. Cellar, shed and outdoors. Spare, full time, year round. We have 25,000 customers. Free Book. Washington Mushroom Ind., Dept. 177, 2954 Admiral Way, Seattle, Wash.

HAMSTERS—Ideal Pets. $2.95 pair. Free Booklet. Jer-Fre's Hamstery, 2425 Hoyt, Muskegon Heights 14, Michigan.

MAKE Big Money Raising Nutria, Chinchillas, Cavies, Mink, Rabbits, or Pigeons for us. Free information. Keeney Brothers, New Freedom, Pennsylvania.

LIVE Alligators $2.50 Postpaid. "Gators," Box 7241, Miami 55, Fla.

18 EARTHWORMS & FROGS

$10,000 YEAR possible, earthworms. 32 Page booklet tells how 35c. Missouri Earthworm Research, Box C-6851, Kansas City, Missouri.

RAISE Nightcrawlers, Redworms, Soilless Method. Three Oaks Ranch, Dresden, Tenn.

$1,000 MONTHLY Possible, Raising Earthworms. African Giants! Backyard, Garage, Basement. Complete Illustrated Booklet, Explains Raising, Feeding, Packing, Marketing. Only 25c! Ozark Worm Farm-V, Willow Springs, Missouri.

19 FARMS, OTHER REAL ESTATE

FLORIDA—Nice homesites, $345 at $10 monthly. Folder Free. Winfree Vernor, DeLand, Florida.

FLORIDA Waterfront Homesites, moderate priced for retirement. Monthly payments. Good fishing, hunting. Adjoins Ocala National Forest. Grace Parker, Paisley, Lake County, Florida.

CANADIAN Tax Sale Lands for three dollars an acre and up. Small monthly payments. Farms, timber, hunting and fishing camps, minerals. Limited number of properties. Write at once for free catalogue. Tax Sale Service, Room 113, 120 Bloor St., W., Toronto 5, Canada.

FLORIDA Trailer Homesites. Water System. $495.00, $10.00 Monthly. Lake Privileges. Box 2005, Deland, Florida.

NEW Strout Spring Catalog just out! Mailed Free! Over 3100 bargains, 34 states, coast-to-coast. Farms, homes, businesses. World's largest. 58 year's service. Strout Realty, 251-ZB 4th Ave., New York 10, N. Y.

SUMMER cabin sites, inside Glacier Park Level, trees, accessible 50x90 excellent title $200 down & monthly. Free folder. Charles Green, Coram, Montana.

FLORIDA—2½ acres; $15 down, $15 monthly; full price—$695.00. High elevation, near Gulf of Mexico. Suitable Farming, citrus, poultry. Free information. Florida Sunshine Coast Development Co., Brooksville, Florida. Dept. PS-2.

FLORIDA'S Most Desirable Secluded Fishing and Hunting Homesites in New Lake Center Development. Surrounded by Lakes. In Famous Panama City Gulf Resort Area. Ideal for Sportsman's and Family Vacations. Only $10 Monthly. Booklet Free. Douglas Wood, Fountain, Florida.

TEXAS Cabin sites. 5 clear mammoth Lakes. Finest fishing, hunting. Good roads, electricity. Developing fast. Private boat dock, fishing pier, barbecue pits, tables, and picnic grounds Free to lot owners. Ideal for retirement or recreation. Near 3 thriving towns. Everything you could wish for Two (2) adjoining lots total cost for both only $145.00, $10.00 down, $10.00 monthly. Write for maps, photos, etc. Dept. GS-11, P.O. Box 50, Kingsland, Texas.

RETIRE In California on $200 Month; Seashore or Desert. Thriving Communities. Healthful Climates. Beautiful Scenery; Good Investment Opportunities. Mail $1.00 for Pictures, Complete Information. Wheeler, Box 405, Hesperia, California.

20 TREES, SHRUBS, ROOTS, HERBS

RAISE Your shrubs, trees from seed. Free planting guide, price list. Woodlot Seed Co., Norway 46, Michigan.

EVERGREENS! 2-year plants, well-rooted. Assorted pine and spruce. Shipped postpaid at planting time; money-back guarantee. 10 for $2; 25 for $4; 50 for $6; 100 for $10. Willowcrest Nurseries, 5727 Grubb Rd., Erie, Pa.

22 PROFITABLE OCCUPATIONS

$5000 FROM Half Acre growing Ginseng, crop bought. Particulars 10c. Associated Growers, Sperling, Manitoba.

FREE Folder, "How To Make $3,000 Yearly Sparetime, Backyard, Raising Earthworms!" Oakhaven-7, Cedar Hill, Texas.

$6,000 FOR Mister, Mrs.: $3,500! Free "Secret Journal" Plan. Magical! Work home! Publico-N44, Oceanside, Calif.

SAVE Money! Buy Wholesale! Free Catalog General Merchandise. Norris, 487-H Broadway, New York.

BIG Profits in Welding. Easy to learn. Low cost training in completely equipped Non-Profit school. GI Approved. Write for Free Booklet—Hobart Trade School, Box P-283, Troy, Ohio.

INVESTIGATE Accidents—Earn $750 to $1,000 month. Thousands of airlines, insurance companies, steamship lines urgently need claim investigators. We train you home spare time. Placement counsel and help. Free book—Now! No obligation. Universal Schools, B2, Box 8202, Dallas 5, Texas.

VENDING Machines—No Selling. Operate A Route of Coin Machines And Earn Amazing Profits. 32-Page Catalog Free. Parkway Machine Corporation, Dept. 17, 715 Ensor Street, Baltimore 2, Maryland.

FREE Book "505 Odd, Successful Businesses." Work home! Pacific—37C, Oceanside, Calif.

VENTURE financing. A pocket guide to modern methods of financing small business. Useful to business men, bankers, lawyers and accountants. Send $1.00 (refundable). Business Publications, 526 1st Ave. North, Seattle 9, Washington.

FREE Literature—Make Big Money Raising Fishworms and Crickets. Carter Farm-10, Plains, Ga.

$60.00 WEEKLY, sparetime—easy! Home Venetian Blind Laundry. Free Book. Burtt, 2434EX, Wichita 13, Kansas.

LEARN Invisible Reweaving At Home. Free Details. Jack's Service, P.O. Box 3451, Freeport, Illinois.

PRECISION Sharpen Scissors, Snips, Pinkers. Using inexpensive outfit. Blackhawk, Sheldahl, Iowa.

WE Pay $3.50 lb. dried. Grow Mushrooms. Cellar, shed and outdoors. Spare, full time, year round. We have 25,000 customers. Free Book. Washington Mushroom Ind., Dept. 101, 2954 Admiral Way, Seattle, Wash.

FREE Book "990 Successful, Little-Known Businesses." Work home. Plymouth, 1610-A 43rd Street, Brooklyn 4, New York.

HOUSEWIVES, Others. $30-$100 Weekly Asembling Pre-Polished Rockhound Jewelry at Home Spare Time. Free Details. Viking, Dept. H, Box 2066, Inglewood, Calif.

WHOLESALE! Thousands Name Brand Products; Free Catalogs! United Wholesalers, 1265T Broadway, New York 1, N.Y.

$30-$60 WEEKLY addressing envelopes. Instructions $1, refundable. Reiss, 210 Fifth Ave., Suite 1102-S, New York 10.

BUY Wholesale! Over 10,000 Nationally Advertised Products, Appliances, Cameras, Sporting Goods, Housewares, Watches, Typewriters, Tools, Clothing, etc. Send Postcard Today. Buy-Rite, Box 258, Hawthorne 7, New Jersey.

FREE "$5,000-$45,000; Unlimited Vacations." Work home! No merchandise, equipment! Haylings-PS, Carlsbad, Calif.

23 BOOKS & MAGAZINES

BRITISH Book Bargains. Any subject. Catalog free. Transbooks, Box 1-PSZ, Wantagh, New York.

GOOD Used Books, 50c-$1. Free Lists. Editions, Dept. PS, Hempstead, New York.

WE want to buy old copies of Popular Science—any issue from period 1890 to 1915. Condition not too important provided books are complete with no pages removed. Write to Box No. 308, Tuckahoe, New York.

SPECIAL 30c—32 Page booklet—"Your Aquarium" for 15c. Innes Publ. Co., 12th and Cherry Sts., Philadelphia 7, Pennsylvania.

NATIONAL Geographic Magazines 1888-1952. Any issue. Periodical Service, Box 465-PS, Wilmington, Delaware.

DISPOSAL Sale. New-used books. List free. Extra Special: 10 books including 4 giant novels $1.00 only. Persil, 436 N. Y. Ave., Brooklyn 25, N. Y.

BOOKHUNTERS: All Subjects. Send Wants! Jaher Book Service, 183 Hazelwood Drive, Westbury, New York.

FREE Copy! "Handbook: Useful Tables." Franks, 3121 South Racine, Chicago 8.

FREE Book Catalog Many Interesting Subjects. Books Publishing Co., Amityville 39, N. Y.

"WHAT A Male Teenager Should Know." 35c. Nailob Enterprises, Box 7103, New Orleans 19, La.

ATHEIST Books. Catalogue free. Truth Seeker Co., 38 Park Row, New York 8.

JOHN Friend, Bookfinder, can get the books you want. Free Search Service. Box 2570PS, Long Beach 1, California.

24 HYPNOTISM

FREE Illustrated Hypnotism, Selfhypnosis Catalogue. Write: Hypnotist, 8721 Sunset, Hollywood 46P, California.

BEGINNER'S Hypnosis . . . illustrated . . . $1.00 Moneyback Guarantee. Baltimore School of Hypnotism, Dept. 82C, Box 6229, Baltimore 6, Maryland.

HYPNOTIZE Successfully! Learn Easy, Fast, Modern Methods. Complete, Illustrated Course, including self-hypnosis and "Secret Nerve Pressure Technique" (Guaranteed Harmless)—$1.00. H. Fowler, 850 Draper Ave., Schenectady 6, New York.

ARE you eating yourself to death? Hypnotically helpful record teaches fatless diet. $1.00 B. Grauer, 210 Fifth Avenue, New York 10.

FREE Catalog! Hypnotism, Autohypnosis! Books, Tapes, Records! Drawer PS697, Ruidoso, New Mexico.

LEARN Hypnotism—our book 25 lessons in Hypnotism shows how to achieve business and social success. $1 postpaid. Satisfaction guaranteed. Books Publishing Co., Amityville 29, New York.

EX-Ray Mind! Hypnotize, one glance. Guaranteed. $3.00. Wamsteker, Box 16, Ottery, Cape, South Africa.

TELEVISION Hypnotist Emile Franchel offers comprehensive home study course hypnotism and autosuggestion for self-improvement. Examinations and certificate. No gadgets—no extras. 6134 Woodman, Van Nuys, California.

"HYPNOTIZE . . . One word . . . One fingersnap," on stage. Satisfaction—or refund . . . $2.00. "Self-hypnosis. Limb-by-limb Technique." $2. Hypnomaster, 846-H6 Sunnyside, Chicago 40.

24A GAMES & ENTERTAINMENT

USED juke boxes, pool games $100. Hit records 30c. Catalog free. Wickens, 1139-W Summer, Appleton, Wis.

25 MAGIC TRICKS, PUZZLES, ETC.

WORLD'S finest professional magic. Joker novelties. Giant illustrated catalog 10c. Top Hat, Evanston 13, Illinois.

3100 NOVELTIES, Jokes, Tricks, Gadgets, Funmakers, Hobbies. Big catalog 10c. Johnson-Smith, D-423, Detroit 7.

ONLY 10c brings you magic's greatest value, Douglas famous Catalog, 500 Tricks, Tricks for amateur and professional, for pocket, parlor, club, stage, with balls, coins, cards, cigarettes, silks, apparatus. Fastest service to magicians everywhere for over 30 years. Amaze your friends, send 10c today. Douglas Magicland, Dept. 20, Dallas, Texas.

GAMBLERS winning, cheating, exposed. Book $1.00. Catalog 10c. Book, Box 671, St. Louis 1, Missouri.

STINKBOMBS. Disgustingly potent! 12/$1. Kits, 1452-G Drake, San Pablo 10, Calif.

"VENTRILLO" Professional Voice Thrower and Catalog 25c! Box 971-PS, Philadelphia 5.

SENSATIONAL Magician's Wand (Vanishes Handkerchief!) 25c, catalog included. Box 1352-PS, Philadelphia 8.

SMOKEBOMBS 25c, 7 for $1.00. (Terrific!) 4463-PS Greene, Philadelphia 44.

DOLLAR Magic Set Free with Catalog 25c. 4462-PS Germantown, Philadelphia.

WHOLESALE! Thirty 10c Trick Novelties $1.00! (Profits!) 1746-SW Market, Philadelphia 3.

279 MAGICIANS Secrets, Vanishing Cards, Magic Catalog, all for 25c. Ward's, Box 391, Jackson Heights 72, New York.

STINKBOMBS. Potent Aroma! 12/$1. Kits, 1452 Drake, San Pablo, Cal.

HINDOO Rope Mystery and Catalog 25c. Hocus Pocus, 317 North State, Jackson, Mississippi.

"102 STARTLING Tricks" Plus completely illustrated catalog 50c. Stowell's, Woodstock, New York.

26 COINS & CURRENCY

GET Profit and Pleasure in collecting old coins. Send 10c for 56-page illustrated coin catalog. You'll be delighted with it. Send for it now. B. Max Mehl, 374 Mehl Building, Fort Worth, Texas. Largest rare coin establishment in U. S. Established 58 years.

COINS from Formosa, Vatican, etc., plus foreign banknote, 10c with coin approvals. Littleton Coin Company, Littleton S2, New Hampshire.

FOREIGN Coin, Banknote and large illustrated coin list for 3c postage. Bargains: Indian Head cent, 10c; Wooden Nickel, 10c; Chinese Dollar, 53c. Approvals included with every order. Tatham Coin Company, Springfield 50, Massachusetts.

OLD and new U.S. gold coins bought and sold. John J. Firpo, 120 Santa Ana Ave., San Francisco 27, Calif.

FREE,** Every serious collector wants our Free circular. Write: Rheike, Wenona, Illinois.

WANTED! Coins! Highest Paid! Confidential catalog, $1. Sullivan's, Endicott Building, St. Paul 1, Minn.

WHAT are your coins worth? Amazing Fell's new 1958 U.S. Coin Book by Jacques Del-Monte. Everything on every single coin minted—worth, value, how to sell, speculating, investment, other valuable facts. Clothbound, 150 illustrations. Send no money. Pay postman $2.00 (plus postage) or $2.00 postpaid (refundable). Fell Publishers, 386-J2, Fourth Ave., New York 16.

1955 MINT set brilliant select uncirculated P-D-S 11 pieces $2.50. 1956 proof set $3.60. 1957 proof set $2.80 mint sealed. Thomas Lavin, 6751 Paschall Ave., Phila. 42, Penna.

WHAT nickel is worth $3.500? Send 25c for latest book showing values of rare American coins. Stack's, 123 West 57 St., N. Y.

OLD money wanted. Do you know that Coin Collectors pay up to $100.00 for certain U.S. Cents? And high premiums for all rare coins? We buy all kinds. Send 5c for Large Coin Folder. May mean much profit to you. Numismatic Co., Dept. 30, Fort Worth, Texas.

INDIAN Cent plus Bargain Lists 10¢. Hutchinson's, Box 4747, Philadelphia 34, Penna.

FIVE Brilliant Uncirculated Coins and Plastic Holder. Last Year (1954) of Complete Mintage San Francisco Mint. $3.50 Postpaid. Louis Bell, Box 1575, Decatur, Alabama.

COIN Magazine, 160 pages. Sample 35c. Numismatic, 7320 Milwaukee, Chicago 31.

COMMEMORATIVE Half Dollar Uncirculated $1.00. Bargain Lists Free. Sayers, 1000 Unaka, Johnson City, Tennessee.

RAREST CC Mint Silver Dollar, 1885 Uncirculated $3.00. Coin Catalogue 25c. Shultz, Salt Lake City 10, Utah.

60 ASSORTED Coins, $1.00. 60 Assorted Bills, $1.00. Oddebon, Box 482, St. Louis, Mo.

COMPLETE United States coin bargain lists, Indianhead cent, 10c. Economy Sales, 156-B Dean, Mansfield, Massachusetts.

LINCOLN Cents 1910-S, 1913-S, 1921-S, 1923-S, 1924-S all for $2.00. Gasser's Box 34615, Los Angeles 34, California.

SIX Different Indian Cents 50c. Three Cent Piece 50c. Half Dime 75c. R & M Coin Co., Box 5, Delanco, New Jersey.

$4,000.00 FOR 1913 Liberty Head Nickel. Uncirculated Dollars 1804—1839. 1893-S, 1895-P, 1903-O pay $100.00—$5,000.00. Certain Dates—Lincoln Cents before 1932—$100.00; Flying Eagle Cents—$500.00; Indian Cents—$140.00; Dimes before 1943—$2,000.00; Quarters before 1924—$1,000.00; Half Dollars before 1905—$1,000.00; 2c Pieces—$100.00; 3c Pieces—$130.00; Half-dimes—$500.00. Hundreds of others worth $10.00—$1,000.00. Canadian Coins—1921—5c Silver—$100.00. 1875 Quarters—$75.00. 1921—50c—$500.00. Wanted—20c Pieces, Gold Coins, Paper Money, etc. Our Large Illustrated Guarantee Buying — Selling Catalogue, Giving Complete Allcoin Information—send $1.00. Purchase Catalogue before sending coins. Worthycoin Corporation, K-409-C, Boston 8, Massachusetts.

SAN Francisco Mint Closed! Made only cents and dimes in 1955. In short supply and great demand. One each, brilliant uncirculated for 25c. Free coin lists with order. Bryson Coin Company, 612 White, Toledo 5, Ohio.

FLYING Eagle Plus Large Cent $2.00. Rhode, 105 Windsor, Reading, Pa.

12 DIFFERENT Indian Cents, and Coin List only $1.00. Pounds, Box 231J, North Wales, Pennsylvania.

WHOLESALE Coins for dealers, investors. Lists 10c. Al Johnson, Box 35, Colorado Springs, Colo.

SILVER Dollars: Uncirculated. 1880o through 1885o $3.50 each. 1893cc $15.00. Retail lists 10c. Holden's, Garwin, Iowa.

GIGANTIC 82-Page Bargain Catalogue $1.00 (Deductible on $10.00 Order). Indian Cents—15 different $1.50; 25 different $3.95. Guidebook $1.75. Fast Service. Bebee's, 4514 North 30th, Omaha 11, Nebraska.

LINCOLN, Indian Cents. All Dates. 1955-S Cent Uncirculated and Complete Pricelist 25c. Penny Mart, CK-11, Box 629, Chicago 90.

ONE Million Dollars Authentic Reproductions of Genuine Confederate Money in $10's, $20's, $50's, $100's etc. only $2.98. Limit Four Million for Only $10.00. Best Values Company, Dept. M-237, 401 Market Street, Newark, New Jersey.

32 PAGE deluxe U.S. illustrated coin list 25c. Stoney, 192-S Washington, Boston 8, Mass.

PROOF-Sets. 1958 Set Only $2.50. 1957—$3.00. 1956—$4.00. 1955—$6.00. 1954—$7.00. 1953—$12.00. 1952—$18.00. 1951—$29.00. 1950—$47.00. Complete Set 1950-1958 Inclusive—$120.00. Postpaid. Prompt Shipment. Money-Back Guarantee. Dan's, Dan Morafka, ANA., 432-S 23rd Ave., San Francisco 21, California.

27 OLD STAMPS WANTED

I Will Pay $100.00 each for 1924 1c green Franklin stamps rotary perforated eleven (up to $1000.00 each unused). Send 20c for Large illustrated folders showing Amazing prices paid for old stamps and coins. Baker-Stamps, (65-PS-28) Oradell, New Jersey.

28 STAMP COLLECTING

TWO $5.00 US stamps plus 20 different, 10c with US approvals. Irwin Stamp Co., Box 1109, Brooklyn 30, New York.

AMAZING Offer! 200 U.S. stamps—including commemoratives, airmails, high denominations to $1.00—only 10c to Approval Applicants!! Illustrated Bargain Lists free. Mystic Stamp Co., Dept. 55, Camden, New York.

ICELAND 10 different beautiful stamps for only 10 cents to applicants for our good old fashioned approvals. Old Colony Stamp Co., Dept. B, Milford, Conn.

UNITED States commemorative collection containing 33 different—10c. Approvals. White, 516-W Avenue L, Brooklyn 30, New York.

WEIRD Diamond Shape Coffee Stamps. Lovely Flower Triangle! First American big commemorative. Greenland Idol Dancer, etc. Free with approvals. Capital Stamp Co., Ferrysburg 10, Michigan.

225 STAMPS For only 10c! This mammoth value includes Airmails, Pictorials; stamps from strange Countries cataloguing up to 25c each! Also Approvals. Mystic Stamp Company, Camden 55, N. Y.

FREE! 107 British Colony Stamps. All different, from Britain's farflung colonial empire. Catalog value $2.50. Free Stamp Magazine. Approvals. Send 10c for handling. Act now! Niagara Stamp Co., St. Catherine's 72, Ontario.

500 DIFFERENT world wide stamps only 50c with approvals. Littleton Stamp Company, Littleton T2, New Hampshire.

FREE! Amazing List! Alphabetical! Two Feet Long! Stampmart, Hartford 1, Conn.

100 DIFFERENT China 10c with Approvals. Plymouth, Dept. A-3, Bell, California.

WOW! 110 All Different Germany 10c Zeppelins, Semi-Postals, Airmails, High values, etc. Giant Catalog, bargain lists included with beautiful approvals. Jamestown Stamp, Dept. A28PS, Jamestown, N. Y

FIRST U.N. Set. Among World's Prettiest. Only 10c. Approvals. Welles, Box 1246-V, NYC 8.

100 DIFFERENT Stamps, 10c with approvals. Smith, 508U Brooks, College Station, Texas.

SUPERIOR worldwide mission mixture. Amazing variety! Half pound $1.60 postpaid. Bay Nielsen, 4545A Harvard, Montreal 28, Canada.

TEN Israel, Free!! Popular-Priced, Attractive Approvals. Accompany. Nymedi, Box 503, Biloxi, Mississippi.

PENNY Approvals. Thousands. Bargains for pennies. Gifts with purchases. Penny Stamps, Orange 2, California.

50,000 STAMP Grab-Bags, 25c each. Anderson, Box 1, Reading, Pa.

FREE! Giant Bargain Catalog—New Edition listing thousands of bargains including U.S. and B.N.A. stamps, packets, mixtures, albums, accessories and supplies; sent with beautiful approvals. Jamestown Stamp, Dept. E28PS, Jamestown, N. Y.

STAMP Collecting Outfit, includes packet worldwide stamps, package hinges, watermark detector, millimeter gauge. Everything 10c with approvals. Lorrain Brown, Marion, Michigan.

FREE! Eight Sided Stamp, Triangle, Diamond, Midget, Mammouth, to approval Buyers. Downey, Box 70-B, Bell, California.

TERRIFIC Stamp Bargain! Israel—Iceland—Vatican Assortment—plus exotic triangle set—Also fabulous British Colonial Accumulation—Plus large stamp book—All four offers free—Send 10c to cover postage. Empire Stamp Corp., Dept. PR, Toronto, Canada.

LIBERIA Beautiful set of four native flowers, priced at 60c in Standard Catalog, only 10c. Approvals. Goliath Company, Bethlehem F2, New Hampshire.

103 FOREIGN Stamps, including Pakistan, Scandinavia, Newfoundland, Australia, Africa, Russia, Japan, China. Oddities, Rarities. Only With Approvals. Enclose 10c for handling. Lincoln Stamp Company, St. Catharine's 319, Ontario.

312 MIXED U.S. only 10c to "Gold Nugget Approval" applicants! Nothing like them. Kessel's, Box 6116, Tucson, Arizona.

FREE—Mint British Colonies from North Borneo, Caymans, Seychelles, Dominica, Papua, New Guinea, Sarawak, Brunei. Free with approvals. Viking, Great Neck 5, New York.

FREE—Stalin Giant "Iron Curtain" Set. Approvals. Seminoles, Dayton, Tennessee.

FREE Stamp Collection. 100 different stamps from Europe, Africa, Asia, Scandinavia, Balkans, etc. 3c to approval applicants. Tatham Stamp Company, Springfield 50, Massachusetts.

U.S. Stamps. Giant bargain catalog—10c. Raymax, 35-VX Maiden Lane, N.Y.C. 38.

110 USED United States commemoratives—many obsolete. Send $1.00. Lincoln Club, Box 211X, Chatham, New Jersey.

1958 U.S. Price List, 25c. Edwin's, Box 796, Rockford, Illinois.

DIAMOND Roosevelt, Pope Triangle, Greenland, Angola, 51 others, 5c. Approvals. Longhorn, Box 3068P, Lubbock, Tex.

CUBA — 25 different 10c, approvals. Dopko, 3482 Laura Lane, Riverside, Calif.

FREE! 15 different Manchukuo, plus World's only Octagonal stamp, plus, Abyssinia Red Cross set, to those requesting approvals. C. A. Cleaveland, 806 North Humphrey, Oak Park, Illinois.

FREE—Valuable USA! (1) Scarce genuine postage stamp picturing first USA, issued in 1847! (2) Big collection 30 all-different U.S.; ancient 19th century, valuable $1.00 stamp, etc. (3) Collection beautiful Commemoratives. (4) Collectors Guide; Big 64-page Bargain Catalog including all U.S. Postage Issues; other exciting offers! Send 10c for mailing expenses. Harrisco, 4164 Transit Bldg., Boston 17, Mass.

TOPS! Free book, "How To Collect Stamps." Send for your copy today! Approvals. Littleton Stamp Co., Littleton E2, N.H.

DEALERS Wholesale catalog. Postage 3c. Frankscо, 5031 Queensbury, Baltimore 15, Maryland.

RHODESIA, Nyassaland Stamp Mixture, 3c. Erickson, 736 E. Cottage, St. Paul 17, Minnesota.

PONY Express Centennial First Day Covers. Send Stamped Self-Addressed Envelope for Details. Kirby, 1657 Pennsylvania, Denver 3, Colorado.

SEND two dimes for the best U.S. catalogue you have ever received. New-Way Stamp, Lawrence, Mass.

OLD scarce U. S. seconds on approval. Slightly defective, bargain prices. Hearnfeld, Clintonhill Station, Newark 8, N. J.

FREE! Tanganyika—Reunion—Nigeria—Madagascar — Cameroons — Guadeloupe — Rhodesia—Nyassaland—Caledonia—Morocco—Greenland—Togoland—Oceania—with Approvals. Send 3c Postage. Thrifty Stamp Company, Woodmoor, Silver Spring, Maryland.

GIANT Approvals, Thousands Different 1c and 2c each. Wahl'r Stamp Exchange, 7006K Farragut, Chicago 31, Ill.

EXCITING "Strange countries" packet. Free with approvals! Saxon, Orange, California.

NEXT ten 3c FD Artcraft Covers $1.00. Aufderheide, Box 224, Trenton 8, New Jersey.

31 HOBBIES, COLLECTING

16MM Sound Films. Hundreds of Titles. Lists Free. Crawford, 412 Page, Ft. Worth

36 RADIO, TELEVISION, SUPPLIES & EQUIPMENT

CANADA: Queens, Wildlife, Commemoratives, Recreation set, 14 var., only 25c with attractive approvals. Rheaume, 6591 11th Ave., Montreal, Canada.

FIFTEEN U.S. Commemoratives 10c; approvals included. Unique, Box 694, Anniston, Alabama.

FREE—Airmails, Commemoratives, Pictorials. Approvals. H. P. Wisehart, Frankfort, Ohio.

300 DIFFERENT given free with approvals. Particulars. Postage 3c. Windsor Stamps, 8834 Cornell Ave., Chicago 17.

PENNY Approvals jammed with Bargains. For better values, try Putnam Stamp Company, Mahopac, New York.

ECONOMICAL ½-3c Approvals. 33,000 varieties. Dresel, Box 128-T, West Englewood, New Jersey.

1500 STAMPS. $1.00. Good variety. On and off paper. World wide. Many pictorials. No approvals follow. Satisfaction guaranteed. Whalen, 1435 First Ave., Oakland 6, California.

QUEEN Elizabeth Mint Sets! Barbados, Virgins, Tristan, Gibraltar, Dominica, Malta. ☑1 Bicolors—25c! Attractive Approvals. Gannon Stamps, Box 931, Canton 1, Ohio.

ICELAND, Surinam, Curacao, Trinidad, Transvaal, Free Interesting, Inexpensive Approvals Follow. Cedar, 1009 E. LaSalle, Barron, Wis.

BRITISH Colonies, 100 Different 10c, also Free Albums, Catalogs for Purchasing Approvals. Coast, P.O. 2187M, Santa Ana, California.

ONE Pound General Foreign Stamp Mixture $2.50. Veteran Frank Stroskey, 223 Market St., Perth Amboy, New Jersey.

FREE United States Commemorative List. H-S, 45 Bromfield, Boston 8, Massachusetts.

100 OLD U.S. Stamps between 1861 and 1935 $1.00. Rousch Stamps, 81 Chestnut, Mansfield, Ohio.

FREE Sample! Illustrated, informative, interesting. National Stamp News, Anderson, South Carolina.

FREE List! Bargain Collections. Merkel Stamps, 30 Grandview, South Hadley Falls, Massachusetts.

FREE Surprise Assortment, 50 Different World Wide. With Attractive Approvals, Popular Prices. Banner, Box 65-A, Park Forest, Illinois.

U.S. Commemorative First Day Cover Free with Approvals. Arrow Stamps, Box 2575, Oklahoma City 8, Oklahoma.

WONDERFUL Offer Seven complete mint sets only 10c with approvals. Reich (S26), 1033 Lawrence, Chicago 40.

FREE 100 Different Stamps with Approvals. Jeans Stamps, Dept. PS, 42 Evergreen Road, North Fort Myers, Florida.

FREE!! Red Cross Triangle, 26 Others. Approvals. World, Box 1762, Wheaton, Maryland.

512 DIFFERENT 50c, 1025, $1.00. Approvals. Klondike, 682 Jefferson, Elgin, Illinois.

FREE San Marino, Mozambique, Czechoslovakia, Australia, Argentina. Approvals. May, Box 986-X, Coral Cables 34, Florida.

CANADA, 100 different 35c with bargain approvals. K. S. Holmes, London, Canada.

QUALITY Approvals At 2c Each. Hadrian, 32 East 29th, New York City 16.

404 DIFFERENT Stamps 25c. Cape Good Hope Triangle Ruand-Urandi, Jungle Set Included in Trylons Super Collection. Catalogs over $12.00. Approval Applicants Only. Trylon, Box 179-S, Forest Hills 75, N. Y.

100 DIFFERENT Austria 10c. Approvals. Irving Aronson, Box F, Newton Centre 59, Massachusetts.

FREE! 50 Different. Approvals. Ehrlich, 426 Jefferson St. N.E., Washington 11, D. C.

KOREAN Set Free With Approvals. W-B Stamps, Wilkes-Barre, Pa.

DARKEST Africa!! Congo, Cameroons, Seychelles, Swaziland, Tanganyika, Urundi, Free!! Fascinating Approvals. Royalton, Box 283, Forest Hills 75, N. Y.

FREE Pictorials to Approval Applicants. Phil-Cob, Box 392, Chatham, Mass.

84 WORLD Coats-of-Arms in Color, 10c With Approvals. Monumental, Box 3507, Baltimore 14, Maryland.

14,000 DIFFERENT! Amazing new plan builds your collection systematically, country by country. Only 50c weekly. Free details. L. G. Ware, Stepney 70, Conn.

100 DIFFERENT stamps, 10c with approvals. Finney, Box 89, El Monte, Calif.

SPUTNIK. The World's First Sputnik Stamp Plus 50 All Different Free With Approvals. Stamp Imports, Peterboro, Ontario, Canada.

U.S. approvals. Low prices. Eagle Stamps, Romine Ave., Pittsburgh 26, Penna.

JAPANESE Commens, Bi-Colors, Parks, 14 Colorful Stamps With Approvals. Only 10c. Norton, Box 926, San Antonio 6, Texas.

1840 GREAT Britain Penny Black. Catalogues $11.00. Special, $1.00. Approvals. Brooks, 2323P Avenue X, Brooklyn 35, New York.

UNITED States. Fine Mint Airmails, #C7, #C8, #C9, #C10. Only $1.15. Approvals accompany. Whiton Paine, Westport 12, Connecticut.

FREE! 25 Different Pictorials. Approvals. Marford, Box 48, Queens Village 29, New York.

250 U.S. Commemoratives $1.00. Wesley Rood, Box 285, Cedar Rapids, Iowa.

LUXEMBOURG, 25 Different 5c. Approvals. Neal, 5950 Tower, Riverside, California.

FREE, Singapore, Borneo, Sarawak, Nyasaland, Tanganyika, Pictorials. 5c Handling. Approvals. Murrays, 1020 Rademacher, Detroit 9, Michigan.

40,000 VARIETIES Available on approvals ½c upwards. Keigwin, Box 933D, Daytona, Florida.

25 DIFFERENT Commemoratives 1893 up 10c. U.S. Approvals. K & B, Box 70, Brooklyn 23, New York.

500 WORLDWIDE Mixture. Big Variety 25c. Monjar, Fairmount, Cincinnati 14, Ohio.

FREE! Pakistan, Malta, Seychelles, Bermuda, Rhodesia, Iraq; Different, inexpensive approvals. Mattenson, Box 985, Philadelphia 5, Penna.

GRAND Comoro Set Free! National Parks Issue, $1.20. Ed Helps, Box 345, Roanoke, Virginia.

COOKS, Indore, Perak, Seychelles, Travancore, Tristan Free with Approvals. Country Stamp Market, Box 310, Titusville, Florida.

60 DIFFERENT U. S., including 30 Commemoratives 25c. No approvals. Seidenberg, Appleton, Wisconsin.

EGYPT 25 Different 3c Postage, approvals. Bellet Stamps, Hazel Park, Mich.

100 FOREIGN, 20 U. S. Commemoratives, 10c. Approvals. Weckerling, 1304I Choquette, Austin 5, Texas.

FREE! 15 Mint French Colonies; Interesting Approvals Accompany. Tropicana, Box 624-S, Oakland Park, Fla.

SELLCT U.S. on approval. Mint, used. Kingsbury Stamps, Fairfax, Vermont.

UNITED States Catalog Free! Bailey Stamps, 45 Bromfield, Boston 8, Massachusetts.

123 DIFFERENT 10c including African Queens. Approvals. Krehl, 1708-S Nebraska, Orlando, Florida.

SELECTED Fine Stamps on Approval. Beginners or Advanced. Wilson, 5028 Onstead, San Diego 18, Calif.

"BACK Seat Driver's License" Stamp Packet. (Dime.) Wayside, Livermore, California.

FREE! 50 U. S. and Foreign. GSAC, 30th & Governor Printz, Wilmington 2, Delaware.

NOW Try Profit Sharing Approvals. Dietze, 130-36 116 Street, Jamaica 20, N.Y.

JAPAN Scarce #609 Cat. $1.50 With Approvals 15c. Benezra, 3530 Paulding Ave., New York 69, N. Y.

SCARCE Souvenir Sheet Free With Approvals. Variety Stamps, Box 98-E, Newton Highlands 61, Mass.

SPECIALIZING Old U. S., Famous Americans, Flags, Presidents, Commemoratives. Approvals Plus Surprise Packet, 10c. Handling. Metropolitan Stamps, Box 312GO, Jackson Heights, N. Y.

NEW French Colony Set 10c With Approvals. Brinkman, 4241 Live Oak, Arcadia, California.

1000's STAMPS Free with Purchases. Details! Stamp Farm, Oxford, Wis.

SPUTNIK commemorative and other out of this world stamps—San Marino dogs, flowers, Chaco heroes, Angola costumes. Only 10c. Free albums, catalogs to our approval buyers. Bell Stamp Service, PS-2, Bell, California.

1,000 DIFFERENT worldwide with Approvals. Alfred Jacobsen, Crompond, New York.

UNITED States 1949-50-51, Used Commemoratives Complete! Regular 69c—Now 29c! Approvals. Peterson, 405 Empire Bank, St. Paul 1, Minn.

1 AND 2 Cent Approvals in Envelopes. Schnoebelen, Columbiana, Ohio.

DELUXE U.S. illustrated list free. Stone, 192 Washington, Boston 8, Mass.

QUEEN Elizabeth 50 Different. 25c. Approvals Accompany. Yokuma, Box 1327, San Antonio 6, Texas.

1000 FINE Mixed U.S. Stamps 25c. Wright's, Box 1122, Hagerstown, Maryland.

U.N. five different 19c. Approvals. Anderson, 1112 Harrison, San Francisco 3, Calif.

IF you have a product or service that can be operated on a mail order basis, write me today. I will send you a Free Kit on "How To Make Money Out Of Classified Advertising". Next issue will be April. Closing date February 21. Hurry—Do it Today! O. K. Kelly, Classified Adv., Mgr., Dept. 28, 353 Fourth Avenue, New York 10, N. Y.

29 ANTIQUES, RELICS & INDIAN GOODS

"ILLINOIS;—Gesundheit!" . . . For Sale; Hundreds of Historical Revolutionary, Civil war, Indian Muskets, Carbines, Rifles, Swords, Bayonets, Powder-horns, Bullet Molds, Holsters, Canteens, Kentucky Rifles Pepperboxes, Duelling Pistols, Stagecoach Guns. 50,000 Collectors Cartridges.—Confederate items, 110,000 Indian Relics, Coins, Agates, Fossils, Mineral Specimen, Arrowheads, Tomahawks, Bannerstones . . . Mounted Birds, Squirrels, Deerheads, Steerhorns, Violin Wood, Bo-wood, Fronties, Gold Dollars, Illustrated Catalog 35c. Heike Gunnery, Wenona, Illinois.

THREE Arrowheads or Two Spears $1.00. Knife, Drill, Scraper $1.00. Palmer, 435 Washington Road, McKeesport, Pennsylvania.

SCALPING Knife, 3 War Arrowheads $2.00. Catalog Free. Arrowhead, Glenwood, Arkansas.

SELLING 100,000 ancient Arrowheads, Spearheads, Tomahawks, etc. List free. Lear's, Glenwood, Arkansas.

BATTLE Relics, Cannon Balls, Coins, Silverware, M-Scope Locators find them. Newest features. Terms. Catalog. Fisher Research, Dept. C-2, Palo Alto, Calif.

10 ARROWHEADS $2.00; Grooved Stone Warclub $2.00. List 10c. Stan's, 1054 Lilley, Columbus 6, Ohio.

30 MINERALS & PRECIOUS STONES

18 COLORFUL and Basic U.S. Mineral Specimens Attractively Boxed with descriptive Folder, $1.00 prepaid, included free dinosaur Bone pocket piece, Rock Haven Mineral Co., Box 155, Whitefield, N. H.

LARGEST gem and mineral magazine tells how to have profitable fun with rocks, gems, jewelry. Monthly. $3.00 year. Sample 25c. Gems & Minerals, Dept. S-3, Mentone, California.

BEGINNER'S Mineral and Gem Study Sets. Free Literature. Mineral Lore, Box 155, Del Rosa, California.

BOOKLET "Panning Gold for Pleasure—Profit." $1.00. Wendt, Troy, New Hampshire.

GEMCUTTING — Silvercraft magazine. Learn to cut gems, make jewelry. Ads give sources equipment, gems for cutters, collectors. Free literature. Sample copy 25c. Lapidary Journal, Del Mar 3, California.

EARTH Science — Rockhounds National Magazine. Subscription $2.00. Sample 35c. Box 1357-PS, Chicago (90), Ill.

TEN N. Mex. Minerals $1.50. 6 Fluorescents $1.00. Five Crystallized Minerals $1.00. Fools Gold 25c. Hartson, Winston 5, New Mexico.

SAPPHIRE, Topaz, tourmaline, garnet, peridot. Five uncut gem specimens, $1.00. Ten polished gems, Baroque shaped, $1.00. Free bargain list, jewelry, gems, profitable, easy "do-it-yourself" projects. O'Brien's, 1115B Wilcox, Hollywood 38, California.

URANIUM Ore Two Types, Taconite with concentrated Pellets, plus Titanium, Five Specimens $1.00. Gemco, Eisner Avenue, Sheboygan, Wisc.

31 HOBBIES, COLLECTING

INVENTING can be an interesting and profitable hobby. Write for complete particulars. Institute of American Inventors, Dept. 30-E, 635-F St., N.W., Washington 4, D. C.

"BRILLIANTIZE" cleans copper, silver, gold, instantly. Safe for proof coins. $1.00 prepaid. Stephenson's, Box 435, Ames, Iowa.

WANTED — Cigarette, tobacco cards. Write Charles Bray, East Bangor, Penna.

COLLECTORS Matchbook covers. 100 Different unused $1.00. Catalog 25c. Album $3.00. Charles Edelman, 1311-P East 84, Cleveland 3, Ohio.

A NEW World of Fascination and Enjoyment With Micro Organic Crystals. Catalog 10c or Send $1.00 for Samples to Riklin Laboratories, Box 3295-S, Seattle, Wash.

TROPICAL Fish, Color Pictures 55 Species. Send 10c. Miracle Filter Co., Box 9128-J, Long Beach, California.

CIVIL War Soldiers for the Dioramist. 32 Illustrated Pages. Catalog #10-E 35c. Bussler Miniatures, 40 Howe St., Quincy 69, Mass.

32 PHOTO FINISHING, PHOTOCOPIES, ETC.

12 EXPOSURE Rolls, 39c. Jumbo prints. Guaranteed work, one day service. Lincoln Studios, Dept. L, Box 13, Lincoln, Nebraska.

PARTICULAR? 8 Jumbos—40c 12—50c Special; 35mm, 36 exposures $1.25 Intro. Offer. Flash Foto, Box 36H, Brooklyn 4, N. Y.

FREE 5x7 introductory enlargement with roll. Finest quality Jumbo dated prints in handy super paks. 8 exposures 35c; 12, 55c. Complete color processing. Big Discounts! Write Globe Photo, Dept. PS, Box 3508, St. Paul, Minnesota.

PHOTOGRAPHY For Pleasure or profit. Learn at home. Practical basic training. Long established school. Free booklet. American School of Photography, 835 Diversey Parkway, Dept. 1742, Chicago 14.

8-HOUR service on deluxe jumbo prints. 8-Exposure roll developed and 8 jumbo prints 40c. 12 exposure 55c. 16 exposure 70c; 35 mm. 20 exposure 75c, 36 exposure $1.25. Jumbo Deckledge Reprints 4c each. Contact prints made if specified. Bay Photo Service, P. O. Box 210, Oakland, California.

32A COLOR PHOTO FINISHING

FREE Color Print Coupon. Professional Quality Ektachrome—Anscochrome Processing—$1.00. Kodachrome—$1.25. Write for Mailers. National Color Corporation, Box 12155-E, Atlanta 5, Ga.

33 MOTION PICTURES, SLIDES SOUND EQUIPMENT

FREE Catalogues. 5,000 8-16MM Films. International Films, Greenvale, New York.

MOVIE Camera Film 8 mm roll $1.50. 16mm 100' $3.00. Free processing. Better Films, 742 New Lots, Brooklyn, N. Y.

SAVE 50%! Guaranteed-fresh color, b&w movie film! 8mm, 16mm. Free catalog! Eso-H, 47th Holly, Kansas City 12, Mo.

FREE catalog. Save $$$. Fresh 8mm, 16mm B&W and color film. Home processing equipment. Superior Bulk Film Company, 442-448 No. Wells, Chicago 10.

RECORDERS, HiFi. Free catalogue. Carstone, 215 E. 88 St., NYC 28.

FREE! Blackhawk's big new 1958 sale catalog new and used 16mm., 8mm. movies; 2"x2" color slides; used 16mm. sound projectors! Biggest stock in USA! Cameras, accessories, supplies, too! Blackhawk Films, Davenport 15, Iowa.

TAPE recorders, hi-fi components, tapes. Unusual values. Free Catalog. Dressner, 69-02 174 Street, Flushing 65, New York.

WORLD'S Largest Film Selection. Features, shorts, new, used. Castle, Official, 8-16mm silent, sound. Free bargain bulletin, specify size. Peerless Camera, 415B Lexington Avenue, New York 17.

35MM Slides Tourist Interest of the World. For details mail 10c to Lawrence P. Helmick, 12047 Aneta Street, Culver City, California.

16MM. Sound Features $15.00. Shorts $3.00. Bedner, 5300 So. Talman, Chicago.

COLOR Slide Samples 25c. Free Slide News. Eddings, 8 Roberts, Corning, New York.

8mm MOVIES. 50 Ft. $1.00. Special Offer. Animals, Cartoons, Travel, Comedies. Send $1.00 or $5.00 for Six Assorted. Movieland Films, Inc., 16121-S Sherman Way, Van Nuys, Calif.

MICHIGAN color slides. Free catalog. Hiawatha, Box 56PS, Ypsilanti, Michigan.

16MM Sound Films. Hundreds of Titles. Lists Free. Crawford, 412 Page, Ft. Worth 10, Texas.

16MM Sound Films. Sold, Exchanged. Duquette, 97-P Snow, Fitchburg, Mass.

34 CAMERAS, PHOTO SUPPLIES

FREE! Free! Send for your new 52 page Photographic Bargain Book. Over 5,000 new and used items at huge savings. For your Free Bargain Book, write to Dept. 412, Central Camera Co., Chicago 4, Ill.

PHOTOGRAPHY For Pleasure or profit. Learn at home. Practical basic training. Long established school. Free booklet. American School of Photography, 835 Diversey Parkway, Dept. 1722, Chicago 14.

SAVE up to 50% on name-brand cameras and accessories. Import your own. Write for details. Nelex, 7810 Greenwood Avenue, Washington 12, D.C.

KODAK, Bell-Howell. Discounts to 40%. Photo Equipment, Appliances. Free Catalog. Mailers Mart, Box 135-PS5, Pelham, New York.

LEICA, Contax, Nikon, Minox, Exakta. All leading brands. Trade, Buy, Sell. Free Catalog. Write Mr. Stacey, Wall St. Camera Exchange, 80 Wall St., New York 5, N. Y.

35 MUSICAL INSTRUMENTS, SONG WRITERS & RECORDS

WANTED! Poems for musical settings. Write Songwriters' Service, Clifton, N. J.

POEMS Wanted For New Songs. Send Poems. Free Examination. Immediate Consideration. Songcrafters, 2724 Arcade Station, Nashville, Tennessee.

SONGPOEMS and lyrics wanted. Mail to: TinPan Alley, Inc., 1650 Broadway, New York 19, N. Y.

SONGWRITERS! Protect your ideas! Hold all poems, songs! Write for safe, correct procedure! Song Service, Dept. PS, 333 W. 56th, New York 19.

POEMS wanted for new songs. Send poems. Immediate consideration. Crown Music Company, 49-P West 32 Street, New York City.

1958 ACCORDIONS—Direct from importer—save 50% and more. Free trial. Lifetime guarantee. Trades accepted. Free Catalog. Write Accordion Manufacturers Outlet, Dept. 28P, 2003 Chicago, Chicago 22.

SONGWRITERS: Recording Company Wants new songs. Royalty basis. National sales, promotion if selected. No charge for melodies. Send material. Music Makers, Dept. G-32, Box 2507, Hollywood, California.

PLAY guitar, any instrument. Guaranteed shortcut courses 60% off. Free Catalog. Staff School, 10-B, Bradley Beach, N. J.

SONGWRITERS—Outstanding, ethical offer. Hibbeler, C-15, 6808 Oleander, Chicago 31, Illinois.

SONGS and poems wanted. Records made. Five Star Music Masters, 646 Beacon Building, Boston.

SONG poems wanted. Free examination. Send Poems. McNeil, Master of Music, 1112-PS Wilshire, Santa Monica, California.

GUITARS—best 1958 buys, discounts! Short-cut courses for all instruments, hillbilly music. Send 25c for big catalog—receive 25c pick and $1 chord finder. Big Sale. Dept. 20A, Bradley Beach, N. J.

MELODIES furnished on 50-50 basis. Records, protection. National Songwriters' Guild, 16D Ocean Shore Drive, Ormond Beach, Florida.

NEW Songwriters, Songpoets share $33 million dollars yearly. Any subject songs, poems revised, composed, published, promoted by largest firm. Information, appraisal Free from Nordyke Music Publishers, 6000 Sunset, Hollywood 28PS, California.

ELECTRIC Guitars, amplifiers, wholesale. Free catalog. Carvin, PSM, Covina, California.

COMPLETE Music Service for Amateur Songwriters. Jerry Colonna, Box 888S, Burbank, Calif.

VIOLINMAKERS supplies. Free Catalog. 309 W. Fourth, Los Angeles 13, Calif.

SACRED music composed; song printed. Reginald Belcher, Box 354, Morristown, New Jersey.

TRADE Hi-Fi Records (33⅓). Send Record (No Scratches, Chips or Cracks) Plus One Dollar for Each Record to be Traded Plus a List of Ten Preferences for Return Record. We Return One of Your Preferences or Near as Possible to It. Cincinnati Record Exchange, 3611 Newton Ave., Cincinnati 7, Ohio.

36 RADIO, TELEVISION, SUPPLIES & EQUIPMENT

BUILD 12 receivers, transmitter, signal tracer, code oscillator, signal injector. Complete home radio course only $22.95. No need to spend hundreds of dollars for a course. For a mere fraction of its real value, our course trains you in basic radio, TV, Hi-Fi. Course includes everything you need: tubes, parts, tools, instructions. Write for full information. Also receive Free Servicing Literature on Radio, TV, Hi-Fi worth $1.50. Progressive "Edu-Kits" Inc., Dept. 551A, 497 Union Avenue, Brooklyn 11, N. Y.

FREE! Giant Bargain Catalog. Transistor, "Sun" Radios, Kits, Portables, Audio, Electronics, Photographic, Optics, Tools, Household. Write Lektron, 1318 Everett Ave., Chelsea, Massachusetts.

RECEIVING tubes, wholesale list free. Spada, 4 Eastview, Rocky Hill, Conn.

CRYSTAL—Radio experimenters. Write to Hulet, 305 Hope, Lakewood, New Jersey.

"15 TESTED One-tube Circuits" with catalog—25c. Laboratories, 328-T Fuller, Redwood City, California.

CRYSTAL Radio kit $1.00, preassembled $1.25, phone $1.75; catalogue. Clearco Crystal Company, 2966 North 4th, Milwaukee 12, Wisconsin.

KITS: Shortwave Radio $3.50—Improved Crystal Radio 75c. Alliance, 2059 60th, Brooklyn 4, New York.

37 BUSINESS OPPORTUNITIES

OPERATE profitable mail order business. Write Walter Service, 4159-B East 112th, Cleveland 5, Ohio.

METALIZE Baby Shoes; Repair Dolls; Rebuild Batteries; Catalogue "75 Ideas" Free. Universal, Box 1076-B, Peoria, Illinois.

FREE Folio "$5,000-$45,000; Unlimited Vacations." No merchandise, equipment. Unknown! Work home—sparetime! Haylings—S-16, Carlsbad, Calif.

BREED Rare Tropical Fish at home. Earn Big Money! Learn Secrets! Help fill huge demand. Amazing Opportunity! Free Plan. Tropical Fish Breeders, FY, Los Angeles 61, Calif.

FIX Typewriters. Inexpensive home course teaches Factory Secrets. Free Booklet. Write, Typewriter, Tarentum 2, Pennsylvania.

WHOLESALE—Get the big merchandise-furniture, appliances, TV's, clothing, tools, auto accessories—most anything. Save half. Literature Free. Associated Wholesalers Service, 1016-C Starr, Burlington, Iowa.

BRUSH Plating Outfits for plating articles in the home and shop. No tanks necessary. Silvering Mirrors spare or full time. Free particulars. Gunmetal Co., Ave. E, Decatur, Illinois.

$70 WEEKLY—Home, spare time. Simplified mail bookkeeping. Immediate income—easy! Auditax, 34757D, Los Angeles 34.

11,000 NEW Prospects Daily. Baby record books, shoes, albums. Sell mailorder. Use our literature. Write: No-Co-Ro, Capitola, California.

GROW Expensive Herbs for Us! Big Profit Home-Business of your own. Year around profitunity. We supply everything necessary! Send for Free Amazing Facts and Revealing Plan. National Herb Exchange, Box FY, Gardena, California.

YOUR envelopes addressed accurately, reasonably. Fast service. We have capable addressers in your city. Glenway System, Box 6568, Cleveland 1, Ohio.

MAKE Extra Money. Cash commissions. Everybody buys easy-to-sell Advertising Book Matches. Union label. Big variety—Glamour Girls, Scenics, Hillbillies. Powerhouse selling kit Free. Steady repeat business. No experience necessary. Superior Match Company, Dept. PX-258, 7528 S. Greenwood, Chicago 19.

LEARN Photo-Negative (Portrait) retouching. Men, Women $5 hour possible spare or full time at home. Easy, glamorous. Work for Photographers by mail order. Full details sent Free. Duval, 100 South Vermont, Los Angeles 4.

YOUR Own name brand business. No investment; no inventory. Part time or full time. Sell famous brands of appliances, housewares, silverware, radios, vacuum cleaners, lamps, tools, clocks, watches, jewelry, etc., etc., over 1,000 items. Join thousands of successful independent dealers. Send for Free catalog and dealer price list. H. H. Davis Corp., Dept. 14, 145 W. 15 St., New York City.

$250.00 WEEK spare time profit possible. Earn at home with new fascinating Printing method. $5 starts you—send no money now. Free Confidential Facts and Valuable Samples. Screen-Print, FY, Los Angeles 61.

PLATE Baby Shoes, jewelry, gifts, bronze and colored pearl. Free Booklet. Anderson, 11029 South Vermont, Los Angeles 44.

HOME-Import Mail Order Business—Import profitable items below wholesale. Experience and product investment unnecessary. Full, spare time. Famous world trader guides you. Free list "157 Imports," details. Mellinger, P692, Los Angeles 24.

"HOW to Start a Business" booklet sent Free! If you Know any Trade—go into business for yourself! Learn the 9 easy steps to follow. We've guided 5,000 others to success. Revealing Free Booklet yours for the asking! Write National Business Consultant, Office FY, Los Angeles 61, California.

MAIL Order—advertising agency executive reveals sensational no-risk advertising and merchandise methods. Start in office or home—minimum capital—positive profits. Free details: Impact! 3407 Prospect Ave., Dept. 2-2, Cleveland 15, Ohio.

FREE Catalog. Contains hundreds of businesses, farms and income properties throughout U.S., Canada. Specify type and location desired. Deal direct with owners. U.I. Buyers Digest, 1608 Hillhurst, Dept. PS-1, Los Angeles 27, Calif.

FREE Folder, "How To Make $3,000 Yearly Sparetime, Backyard, Raising Earthworms!" Oakhaven-42, Cedar Hill, Texas.

GROW a living Miniature Forest or orchard (only inches high) that bears tasty tiny fruit at home. Learn amazing Dwarfing secrets! Sensational Fascinating hobby. $$$$$ Home-business Opportunity. Free Details! Miniature Nurseries, Dept. FY, Gardena, California.

LET Me Sell Your Products Nationally I'll Send You Free Information On How To Establish Sparetime—Full Time Casecraft Business. You Build! We Sell! Everything Supplied. Abarsi, 807-WH Sunset, Los Angeles 12.

BECOME Tax Consultant. Graduates earn to $3,000 every tax season preparing returns evenings. State approved. Union Institute, Hoboken 1H, New Jersey.

1000 BRED Mink—Booklet, plans 25c. Lake Ontario Ranch, Gravel Road, Webster, N. Y.

"50 NEW Home-Business Ideas" Booklet, sample Free. Spray exotic Velvet-Suede on anything. Flockcraft-FY, Los Angeles 61.

MINK Raising information free. Complete. Lake Superior Mink Farm, Superior E E5, Wisconsin.

VENDING Machines—No Selling. Operate A Route of Coin Machines And Earn Amazing Profits. 32-Page Catalog Free. Parkway Machine Corporation, Dept. 18, 715 Eutaw Street, Baltimore 21, Maryland.

GROW Orchids at home. Profitable, fascinating. Successful home grower explains special light, temperature and humidity conditions orchids need. Free—Full details. Orchids, 100 S. Vermont, Los Angeles 4.

BE appointed state notary public now. Write—Stationers, Boerne, Texas.

$100.00 WEEKLY spare room. Raise redworms soilless way. Odorless. Charlie Morgan, Box 116C, Bushnell, Florida.

QUICK profits, with no capital! Take orders for magazines your neighbors like, want. Make cash on the spot! We show how with Free kit. Get yours now. Write McGregor Magazine Agency, Dept. 340, Mount Morris, Ill.

WE Establish you in your own mail order discount business. Sell appliances, gifts, books, housewares, watches, jewelry, cookware, tableware, dinnerware, cutlery, etc. at discount to 75%. No stock needed. We ship orders under your name. Selfselling catalogs printed with your name, advertising postcards, circulars, names of mail order buyers supplied. Catalog, details free. Topval Corp., Lindenhurst 421, N. Y.

BUY at Wholesale Prices! Resell at Big Profits. Brand name merchandise—Appliances, cookware, housewares, watches, jewelry, rings, dry goods, clothing, luggage, tools, sporting goods, toys, gifts, etc. Free 1958 color catalog. Write today. Merit Home Products, Dept. PS-2, 107 Manhattan Ave., Brooklyn 6, New York.

"MAIL Order Business" Magazine. Most Comprehensive Mail trade journal in the world! 2 Sample issues $1.00. Refunded if Unsatisfactory. Box 501-CM, Lynn, Mass.

$250 WEEK reported! Free book "505 Odd, Successful Businesses." Work home! Expect something Odd! Pacific-36C, Oceanside, California.

FAMOUS Silicon Waterless Battery Exclusive Distributorship now available most areas. Factory-sealed, guaranteed trouble-free for 10 years. Investment for merchandise only. Tremendous profit opportunity. Free franchise. Waterless Battery, Dept. 203, El Segundo, California.

SPARETIME cash at home filing saws by machine. Free plan tells how. Charles E. Foley Co., Columbia Heights, Minn.

YOUR own $10,000 a year business! No investment. Sell new Air Cushion Shoes spare time. Immediate commissions, bonus. Samples supplied. Charles Chester Shoes, 272, Brockton, Mass.

INTERNATIONAL mail-order business. Complete setup service—not just instructions. Hermes, 152-R West 42, New York City 36.

INVISIBLE Reweaving: $5 in one hour possible reweaving burns, tears, moth-holes. Spare-Full time. Free Details. Skil-Weave, Dept. C-132, 335 W. Madison, Chicago 6.

MAKE Perfumes, Products. Write for Free Literature. Specialty Manufacturers Supply, 239 Ideal Way, Charlotte 3, N. C.

WHOLESALE catalog! Appliances, housewares, etc. T & M Supply, Box 231, Egg Harbor, N. J.

CLEANS windows without mess. Strange "dry" cleaning-cloth. Replaces liquids. Windows gleam. Samples sent on trial. Kristee 116, Akron, Ohio.

"EVERYBODY Likes Candy"—Make Professionally Home . . . (Our 48th Year.) Ragsdale Candies, D107, East Orange, New Jersey.

BALL Point Pen Refills—Fits Paper Mate, Others. $7.50 per 100. Triple Your Money. Hurry! Park Products, Box 73, Highland Park, New Jersey.

$600.00 PROFIT. Mailing 100 catalogs! Catalogs feature items paying You up to 85c profit on $1 items. Work from your Home or Office. No need to carry stock. We drop ship. Start Immediately! Send only $1 (cash, check, Money Order or stamps) for 10 catalogs, or 25c for Sample. Free instructions included. Costar's, G.P.O. Box 972-PS, New York 1.

FRANCHISE Dealers Wanted. Financial Recommendation Service. Information, Service and Stock Report $5.00. Box 1442, Bridgeport, Conn.

PLASTERCRAFT molds, liquid rubber, plasters, flocks, candle supplies. Catalog and manual free. Jayhawk Plasters, Blue Rapids, Kansas.

NATURAL Molding Rubber; Extra Thick Free Sample. W. Wooley, 1016-B Donald, Peoria, Illinois.

ABSOLUTELY Free. "Mailorder Treasure Chest." Tasker, 1603 Peach Street, Alexandria, Virginia.

FREE Literature—Make Big Money Raising Fishworms and Crickets. Carter Farm, Plains, Ga.

OPPORTUNITY to earn $15,000-$30,000 annually. Franchise protected. Granted on $12,500 basis. Live at home. No merchandise to buy. Selfemployed. One of most exclusive and noncompetitive Businesses in United States and Canada. Send for free explanatory booklet. Harrell and Company, Box 8-D, Louisville, Illinois.

IMPORTING. Modern dropship method. Details free. The Hazen Company, 6601S 8th Avenue North, St. Petersburg 10, Fla.

SELL Books by mail. 400% Profit. Royal, Box 368-M, Cleveland 27, Ohio.

$250 WEEK cleaning venetian blinds. Patented Machinery. Free literature. Robinson, 7213-L, Indianapolis 1, Indiana.

LIQUID Rubber. Make flexible molds. Free Sample. Chaney, 1907-C East Rd., Jacksonville 11, Fla.

INTERESTED In Mail Order? Investigate Facts Before Plunge. Free Information. Fosters, Box 8382-D, Albuquerque, New Mexico.

TO $100.00 weekly, Sparetime, home operated mailorder business. Successful "Beginner's" plan. Everything supplied. Lynn, 10420-C National, Los Angeles 34.

100% PROFIT. No Investment. Stamp brings details, samples. Miller, Box 564, Brooklyn 1, New York.

MAKE New Greaseless Doughnuts In Kitchen. Sell stores. Free recipes. S. Ray, 3605 South 15th, Minneapolis 7, Minnesota.

MAKE flexible molds. Cast plaques, figurines. Free sample. Tooker, 1045-A Fairview, Hamilton, Ohio.

EXCLUSIVE List of New Products and Sales Ideas. Obtain Franchise. $1.00. McLaughlan, 378 Baldwin, Jersey City 6, N. J.

$60.00 WEEKLY, sparetime—easy! Home Venetian Blind Laundry. Free Book. Burtt, 2434ET, Wichita 13, Kansas.

WORLD'S Greatest Instant Bathroom Odor Banish. Cost Penny. Sells $1. Write By-Lo Products, Blythe, Calif.

STOP Wrinkles $3. Instruct Others. Details. Ernelda Gardiner, 330 East 257 St., Euclid 32, Ohio.

97 WAYS To Make a Million. Start from Scratch. Grow Big. Others Have. You Might Too. Get Free Details. Fast. Woodward, 1221 Edgewood, Havertown 2, Penna.

READ "Mailorder Laws and Regulations" and "Mailorder Rules for Beginners." Learn about necessary licenses, different taxes, legal requirements, etc. Both books, $2.00. Tasker, 1603 Peach Street, Alexandria, Virginia.

WE Pay $3.50 lb. dried. Grow Mushrooms. Cellar, shed and outdoors. Spare, full time, year round. We have 25,000 customers. Free Book. Washington Mushroom Ind., Dept. 178, 2954 Admiral Way, Seattle, Wash.

POTTERY Made Without Molds! Self-Hardening. No Firing. Gorgeous Colors. Lawn Ornaments, Novelties, Cemetery Products. Particulars Free. Marbleize Service, Edwardsville, Illinois.

$6,000 FOR Mister, Mrs.; $3,500! Free "Secret Journal" Plan. Magical! Work home! Publico-N33, Oceanside, Calif.

FREE "Franchise Profit Letter" describes Nationwide Opportunities. Exclusive Distributorships, Dealerships, Agency Operations. Write Today. National Franchise Reports, 333 North Michigan, Chicago 1.

EARN $10,000 Yearly Raising Angora Rabbit Wool for Us. Information 25c Coin. American Angora Company, Malta 1, Montana.

IF You Have Tried Any Small Business Venture—Mail Order, Service Operation, Small Manufacturing, etc. Write for Information, Regardless of Previous Results. Del Norm Company, Hartstown, Pa.

MAKE $46 From Square Foot Plywood; Jigsaw necessary. Free Details. Woodarts, Bridgewater, Mass.

YOUR Own Home Business. Successful Plan—25c. House of Lords, 30 Titcomb, Newburyport, Mass.

WANTED—Limited number intelligent Men and Women to work at home on exclusive Mail Order Business proposition. No selling—we furnish everything including literature, names, addresses, stock and ship items for you. Free Details. Mail Order Distributors, FY, (Franchise Division), Los Angeles 61.

OPERATE profitable mailorder business! Free details. Thomas Bond, 1637-R West Vernon, Phoenix, Arizona.

CASH From Sawdust, Tin-Cans, Newspapers. Over 200 Methods. Instructions $1.00. Charles Company, 12-XBD, Norwood, Ohio.

PIANO Tuning learned quickly at home. Tremendous field! Musical knowledge unnecessary. Information free. Empire School of Piano Tuning, Champaign, Illinois. (Founded 1935.)

EARN $10,000 Yearly—only two sales daily. World's Best Seller, The Holy Bible (Illustrated) Protestant or Catholic. Margarete's, P.O. Box 82, Hazleton 6, Pa.

OPPORTUNITY. Own Profitable Repeat Business. Part, Full Time, or Mail Franchise Details from Henford, P.O. Box 525, Fair Lawn, N. J.

SELL Nu-Motor. Amazing Concentrated Motor Rejuvenator. Exclusive Repeat Business. Palmer Sales, Lowellville, Ohio.

"FLOCKON" New Profitable Way to Beautify Anything. Automobiles, Signs, Novelties. Make $15.00 Hourly. Send for Material. Complete Instructions. Introductory Offer $3.00. United Flockon Company, 820 Tauton Avenue, Seekonk, Massachusetts.

$1000 MONTHLY Possible. Sparetime. Home Mailorder Business. Write Stevens Company, Box 188, Ft. Gibson, Oklahoma.

CANDIED Popcorn and Potato Chip Equipment. Eakins, Box 933-B8, Springfield, Ohio.

LEARN Mailorder Selling. Pays Big! Free Colliers' Reprint! Elliott, 216-B W. Jackson, Chicago 6.

MAKE strange plastic building material of waste, easily. Water, fire, wear and termite resistant. Bays Laboratory, Oklahoma City 9.

"HOME Business Digest" Since 1899. Includes "Newest Products Report." $2.00 Year. $3.00 Two Years. 35c Sample Copy. M. Brown, 616 N. Cayuga St., Ithaca, New York.

BRAND-New: Wholesale Books Directory—800% Profit. Importer's Guide—Worldwide Importing. Drop-Ship. Free Details: Goldland, 13913 Doty, Hawthorne, California.

RUBACREAM! Concentrated latex cream! Makes molds quicker! Thicker! Instructive literature free! Castcraft Studios, 508-PS Marion St., Brooklyn 33, N. Y.

START Profitable Home Mimeographing Service. Our Exciting Secret Plans Expose How! Write: Mozelle, 506 Cherry, Bonham, Texas.

$100.00 EVERY Day! Amazing Battery Rejuvenator. Sample $1.00. Laboratories, Charleston 28-S, South Carolina.

BUY Wholesale 879,000 Items! Cottage Industries, Box 51-PSA, Des Plaines, Ill.

SPECIALIZED Magazines—Free List. Over 5,100 Publications, Current Copies. Over 1,100 Self-Help Books. All Trades, Businesses, Vocations, Hobbies, Sports. Commercial Publications, Box 44S, Franklin, Indiana.

BUY Wholesale! Over 10,000 Nationally Advertised Products. Appliances, Cameras, Sporting Goods, Housewares, Watches, Typewriters, Tools, Clothing, etc. Send Postcard Today. Buy-Rite, Box 258, Hawthorne 5, New Jersey.

MAILMAN Brings $150 Daily. Tested, Authentic, Amazing Mail Order Opportunity. Details Free. Holiday Publications, 2301 Greysolan Road, Duluth, Minn.

COLORGLAZED Concrete pottery made without molds. Patented method. Cemetery products, novelties, tiles, Basement leak-sealing. Money-making projects. Booklet, details free. Men only. National Potteries, Grand Rapids, "Minnesota."

Make Money Writing Short Paragraphs. Information Free. Barrett, Dept. CX-28, 7464 N. Clark, Chicago 26.

IF you have a product or service that can be operated on a mail order basis, write me today. I will send you a Free Kit on "How To Make Money Out Of Classified Advertising". Next issue will be April. Closing date February 21. Hurry—Do it Today! O. K. Kelly, Classified Adv., Mgr., Dept. 28, 353 Fourth Avenue, New York 10, N. Y.

WANT To Make Big Money At Home? $10.00 profit in an hour possible with Invisible Mending. Make tears, holes, disappear from clothing, fabrics. Steady year-round demand from cleaners, laundries, homes. Details Free. Fabricon, 6244 Broadway, Chicago 40, Illinois.

38 MONEYMAKING OPPORTUNITIES

SELL Titania Gems: far more brilliant than diamonds. Catalog 10c. Diamonite, 2420-S 77th, Oakland 5, California.

HOMEWORKERS! Write for exciting details concerning Addressing and Mailing. Temple Co., Muncie 7, Indiana.

DETECTIVES—Work home—Travel. Experience unnecessary. Detective Particulars free. Write, Wagoner, P-125 West 86th, New York 24.

MEN-Women! Start Money-Making Plastic Laminating Business at home in spare time. Material that costs 11c brings back $2.58. No canvassing or selling but mail orders bring in $20 a day. Write for full particulars Free. Rush name on postcard to Warner, Room CL-3-A, 1512 Jarvis, Chicago 26, Illinois.

MONEY Plans! "Secret Journal." Grandpa, two daughters made $2,500 first month. Work Home! Publico-N22, Oceanside, Calif.

SAVE Up to 80% on Name Brands of Jewelry, Watches, Appliances, Furniture. Names of Twenty Wholesale Firms that Furnish You Free Wholesale Catalogs. Rush $1.00 to Abbott Wholesale Distributor, 287 Abbott Road, Buffalo 20, New York.

HOTTEST Mail Order Plan Ever! Sell photos, films, art novelties. Huge proven profits! Free Details! Profits Unlimited, Dept. 2F, 15015 Ventura Blvd., Sherman Oaks, Calif.

VENDING Machines—No Selling. Operate A Route of Coin Machines And Earn Amazing Profits. 32-Page Catalog Free. Parkway Machine Corporation, Dept. 19, 715 Ensor Street, Baltimore 2, Maryland.

MAKE $5,000 yearly sparetime raising mink, chinchillas, nutria, etc. Free booklet reveals proved plans. Write: Purs, 588 Mt. Pleasant Road, Toronto 2, Canada.

137 BUSINESS Plans Collection. For home or outside, sparetime possible. Little or no capital, big profits potential, practical, diversified. Mandry and Tous, 216 West Jackson Boulevard, Chicago 6.

$1,000.00 MONTHLY for 27 Years! Stay home and enjoy life with most fascinating mailorder business ever conceived. Mailman has put over $250,000.00 into one mailbox under this plan. Learn how you too can start, now. Free facts. Business Specialties, 262 Byxbee, San Francisco 27, Calif.

START Big-Pay business at home in spare time. No experience needed to operate little table-top machine for bronzing baby shoes. Make $5.46 profit on every pair. Full particulars free. Send postcard to Mason, 1512 Jarvis, Room CM-3-A, Chicago 26, Illinois.

EARN cash at once, sending us easy orders for magazines your friends, neighbors want. Instant profits! We show how. For Free kit, everything you need, write McGregor Magazine Agency, Dept. 350, Mount Morris, Ill.

"100 WAYS to Start Your Own Business." Free Pamphlet. 100 Businesses, Box 68-S, Omaha.

FREE Book "505 Odd Successful Businesses." Work Home! Pacific-35c, Oceanside, Calif.

PRINTING, office supplies wholesale. Save 50%. Royal, Box 368-S, Cleveland 77, Ohio.

$1 TO $20 Checks daily! Write simple sentences, paragraphs, poetry for pay! No experience necessary. I tell you What to Write—How to Write—Supply large list of Buying Editors. Begin Writing For Pay—Today! Will Herman, 1726 W. 25th St., Cleveland 13, Ohio.

SPARETIME Repeat Profits Taking Magazine Subscriptions. Special Offers. Cassell Agency, Boynton Beach 7, Florida.

SUCCESS Ahead! $10.00 to $100.00 Weekly Hobby Business Assured. Choose Your Hobby. It Pays. Details Free. Success, RDR-2, Box 133A, Nixon, N. J.

JOIN the Prosperity Parade with a Mail Order Bookshop in Your Own Home. Valuable Information Free. Practical Publications, 3974-6 Milwaukee, Chicago 41, Ill.

$60.00 WEEKLY, sparetime—easy! Home Venetian Blind Laundry. Free Book. Burtt, 2434EU, Wichita 13, Kansas.

$36-$200 WEEKLY Plating Baby Shoes, Making Jewelry, Novelties, etc. at Home. Details Free. Jo-Ca Electroplater, 7840-A Northwest Sixth Court, Miami 50, Florida.

DOLLARS Every Day! Amazing Magic Mailorder Plan. Setup Free. Miller, Box 588-A, Oshkosh, Wisconsin.

MAKE $200.00 Monthly Spare Time With Jigsaw. Free Details. Elkman, 346 N. Summit, Sioux Falls, S. Dak.

FREE Literature—Make Big Money Raising Fishworms and Crickets. Carter Farm-11, Plains, Ga.

MEN and women wanted to start home business in spare time with little table-top rubber stamp machine. Easy to earn up to $9.80 an hour without previous experience. Full particulars Free by mail. Send postcard to Roberts, 1512 Jarvis, Room CR3A, Chicago 26, Illinois.

RETIRE Early. I Did. Have Everything I Want. Home, Bank Account, Real estate, Yacht, Vacations. You Can. "Know How" $3. Only Investment. No Growin', Hoein', Feedin' or Mailorder. Capt. Wm. Lewis, P. O. Box 10005, Tampa 9, Fla.

TAPE Recording—Fabulous New Business! $500.00 Monthly spare time! Entire country wide-open. Free Facts. Dixieland Publishers, Asheboro 8-B, North Carolina.

INTERESTING Mail Free. Lucky Midget Bible 50c. John Morris, 3355 Lemon, Riverside 29, Calif.

MAKE Money Addressing! Literature explaining, free. Cove, Box 2580-L, Greensboro, N. C.

WE Pay $3.50 lb. dried. Grow Mushrooms. Cellar, shed and outdoors. Spare, full time, year round. We have 25,000 customers. Free Book. Washington Mushroom Ind., Dept. 179, 2954 Admiral Way, Seattle, Wash.

$15,000. PROFIT in One Year Possible, on $5.00 cash and just 3 hours attention weekly! Experience unnecessary! Fabulous but true! Proof, complete detailed Plan, only $1.00—satisfaction or refund! Columbia Enterprises, 8203-S Grubb Road, Silver Spring, Maryland.

"HOME Business Digest" has Moneymaking Opportunity Galore. Sample 25c. Donovan, 79-PS Greenbelt, Levittown, New York.

BIG Money Earned While Asleep! Neighbors Think I Struck Oil! They've Hunted My Big Secret 8 Years. Not Another Scheme, But Legitimate, Sound Proposition Easily Handled by Anyone. Nothing Like It! No Selling. Details $1.00 (Refundable). Grant, Grantham, Penna.

AMAZING Successes Through Franchises! Become Exclusive Franchise Holder Your Territory. Information Rushed. National Franchise Reports, 333 North Michigan, Chicago 1.

FREE Folio. "$5,000-$45,000; Unlimited Vacations." No merchandise. Unknown! Work home—sparetime! Haylings—S16, Carlsbad, Calif.

START Home Mail Order Business. I Made Enough Money to Retire. Now Own $18,000 Home, Drive Cadillac, Have Money in Bank. Amazing Facts Free. N. Cole, 217 49th Street West, Bradenton, Fla.

$2,000 IN 3 Weeks. Guaranteed Investment Plan. Stark, 14321 Wentworth, Chicago 27.

MEN Sell One of the Fastest $1.00 Seller. Up to 80% Profit on Every Dollar. Six Sample Sets $2.00. Sell for $6.00. Act Now. Free $3.00 Men Wallets. Free Wholesale Catalog of Name Brands, Watches, Jewelry, Appliances, Novelties. Free $2.00 Credit Certificate to be Deducted, on First Order. Be Distributor. Sell to Dealers and Friends at Wholesale Prices. You Have Everything to Gain. Send for Your Free Wallet, Catalog and Credit Certificate. Rush $2.00. Abbott Wholesale Distributor, 287 Abbott Road, Buffalo 20, New York.

MAKE Money. Mailing Sample Business Cards. Vosacek Printing, 4444PS Ute, San Diego 17, Calif.

"405 OPPORTUNITIES, 225 Secret Ideas." Gilbert Risden, 2735 Grand River, Detroit 1, Mich.

BRONZED Baby Shoes Mountings. Prompt Delivery! Forster, 1520 Ardmore, Chicago 26.

TYPISTS! Make Money At Home! Mailers. 2 Madison, Greencastle, Indiana.

$30-$60 WEEKLY addressing envelopes. Instructions $1, refundable. Reiss, 210 Fifth Ave., Suite 1102-W, New York 10.

MAKE Money Clipping Newspaper Items For Publishers! Detailed plan. Newscraft, PS-983-E, Main, Columbus 5, Ohio.

BUY Wholesale! 30-80% Discounts! Appliances, Gifts, Typewriters, Tools, Watches, Sporting Goods, Jewelry, Cameras, Housewares, etc. Consolidated Distributors, Clifton 11, New Jersey.

FREE Folio! Work at home. Sparetime! Send Stamp. Jackson's, Box 37215-37, Los Angeles 37, California.

WANT Daily Cash in Your Mailbox? Pleasant Homework Provides Greatly Appreciated Service to Customers and Big Profits to You! Details Free. Milford House, Salem 1, West Virginia.

IF you have a product or service that can be operated on a mail order basis, write me today. I will send you a Free Kit on "How To Make Money Out Of Classified Advertising". Next issue will be April. Closing date February 21. Hurry—Do it Today! O. K. Kelly, Classified Adv., Mgr., Dept. 28, 353 Fourth Avenue, New York 10, N. Y.

38A BUY IT WHOLESALE

LARGEST Wholesale Supply Source In U.S. Get 23 free catalogs. Furniture, clothing, appliances, autos and accessories, farm equipment, tools, housewares, hobby supplies. Free details. Associated Wholesalers, Box 52-C, Burlington, Iowa.

BIG Multicolor Wholesale Catalog! Housewares, appliances, clothing, silverware, cookware, luggage, binoculars, radios, phonographs, cameras, recorders, projectors, typewriters, shavers, sporting goods, toys, tools, sewing machines, watches, jewelry. Name brands. Huge discounts. Postcard: Selbyco, Decatur 165, Illinois.

5 WHOLESALE Bargain Price Catalogs: During the year, Clothing for entire family, Sheets, Blankets, Towels, Kitchenware, Drug Sundries, Jewelry, Notions, Appliances, Luggage, Vitamins, Toys, Novelties, Fans, Gift items, Watches, Clocks, School Supplies, Tools, Color Television Screens, Cushion Vibrators, Televisions, Radios, High-Fidelity Phonographs, etc. Specials, Close-Outs (Over 1500 items). Discounts to 75 percent. Rush $1.00 deposit, refundable. Broehm Products, PS-2569 North 12th Street, Milwaukee 6, Wisconsin.

ELECTRIC Guitars, amplifiers, wholesale. Free catalog. Carvin, PSW, Covina, California.

FREE Wholesale catalog. Gifts, appliances, books, housewares, watches, jewelry, cookware, tableware, dinnerware, cutlery, etc. Discounts to 80%. Topval Corp., Lindenhurst, 222, N. Y.

BUY Wholesale! Thousands of Nationally Advertised Products! Sporting Goods, Radios, Phonographs, Records, Watches, Cameras, Projectors, Telescopes, Binoculars, Typewriters, Bicycles, Luggage, Shavers, Furniture, Appliances, Tarpaulins, Power Tools. Send Postcard Today! Southland Products, Lincolnton 10, North Carolina.

WHOLESALE! Appliances, Tools, Clothing, Jewelry, Everything! Free Catalogs! United Wholesalers, 1265-P Broadway, New York 1, N. Y.

1958-1955 AUTOMOBILES! 40% Off! Guaranteed! Jakiela, 2644-SNO Western, Chicago 47.

BIRCH Kitchen Cabinets. Free Catalogue. Charlotte Wood Products, Charlotte, Michigan.

DISCOUNTS To 92%! Appliances, Watches, Housewares, Gifts. Turner, 2105 Central, Alameda, California.

BUY Wholesale Nationally Advertised General Merchandise, Appliances, Sporting Goods, Jewelry, Watches, Tools, Radios, Cameras, Typewriters. 106 Page Catalog $1 Refundable First Order. Keystone Industries, 1311 Morse Avenue, Dept. S, Chicago, Illinois.

BUY Wholesale! Over 10,000 Nationally Advertised Products. Appliances, Cameras, Sporting Goods, Housewares, Watches, Typewriters, Tools, Clothing, etc. Send Postcard Today. Buy-Rite, Box 258, Hawthorne 8, New Jersey.

39 FORMULAS, PLANS, ETC.

FORMULAS—All kinds. Latest products. Literature free. Kemico, Park Ridge 15, Ill.

LATE Modern Manufacturing Formulas List Free. Chemical Service, Martville, New York.

MODERN Formulas for the best in fast selling, big profit products. Eye-opening literature free! Miller, Chemist, 1517-S, Tampa, Florida.

40 PLASTICS

LEARN Plastics Fabrication For spare time income. Low cost home training now available. Write for free booklet. Interstate Training Service, Dept. D-2, Portland 13, Oregon.

NEW Liquid Casting Plastic, clear, colors. Embed real flowers, coins, photos. New Manual shows fine things you can make at home and sell at big profit. Send 25c. Castolite, Dept. B-102, Woodstock, Illinois.

LAMINATING Supplies. Price List Free. Solomson, 46 Cornhill, Boston 8, Mass.

FREE! Beautiful Plastic Novelty and Catalog. Casting Plastics! Clear, Colors, Marble, Jewelry and Supplies. Write Today. Castacraft Corp., Dept. S-280, P.O. Box 555, Palo Alto, Calif.

PLEXIGLAS. Square foot cost, 1/16"—$1.20; 1/8"—$1.52; 3/16"—$1.86; 1/4"—$2.21; 3/8"—$3.23; 1/2"—$4.35. Colors add 18%. Send 15% for postage. Aristocrat Plastics, 23 Sussex Avenue, Newark, N. J.

PLASTIC Casting and Mold Supplies—Catalog Includes Instruction in Mold Construction, Casting, Manufacturing Methods. Liquid Glass, Steel, Rubber. Send 25c. Gel, Box 261, Union, N. J.

PLEXIGLAS — Any thickness — Clear —Colors—Cut to size—Clear Rods—Tubing. McClarin Plastics, P.O. Box 168B, Hanover, Pennsylvania.

"CHEMIGLAS" Liquid Polyester, 18 Oz. Casting Outfit, $2.10. Technicraft, 1156 Commonwealth, Boston 34, Mass.

41 CHEMISTRY & PHYSICS

FREE Chemicals and chemistry literature Directory. National, 1148 Fifth, Redwood City, Calif.

ILLUSTRATED Catalog; Chemistry, mineralogy, biology 25c. Tracey Laboratories, Evanston, Illinois.

CHEMICALS, highest quality in small quantities. Laboratory apparatus; biologicals, 26th year. John H. Winn Co., Inc., 124P West 23 St., New York 11, N. Y. Catalog 25c.

CHEMICALS and apparatus for industrial, analytical and private laboratories. Catalog 25c. Dept. M-26, Biological Supply Co., 1176 Mt. Hope Ave., Rochester 20, N.Y.

AMAZING New Book Of Science Experiments, Formulas, and Catalogue of Laboratory Supplies. Only 25c. National Scientific Co., Dept. PS-2, 500 West Road, Lombard, Illinois.

CHEMISTRY-Science magazines. Literature free. "Lankton," Box 5126-D13, Lansing 6, Mich.

CHEMICALS, Glassware Catalog, 25c. Laboratory Sales, Box 161-B, Brighton, Mass.

EXPERIMENTERS: Bargains Catalog, 25c (Refundable). Hagenow Laboratories, 2414 Clarks, Manitowoc, Wisconsin.

42 HELP WANTED REPORTS

COPYRIGHTED Reports on best paying jobs with travel, adventure, promotions, Construction, aviation, shipping, laborers, clerical, trades, supervisory, factory, unusual opportunities. Many types of work. Skilled and unskilled. Foreign and stateside openings for men and women. Only $2.00 ($2.25 airmail), including registration-advisory service. Satisfaction guaranteed. Included absolutely free: Special reports on Alaska, Spanish airbase construction, South American opportunities and husband-wife foreign jobs. Research Services, Suite 514-PSV Meramec Building, St. Louis 5, Missouri.

AMERICAN Overseas Jobs. High Pay. Men, Women. Transportation Paid. Free Information. Transworld, Dept. B, 200 West 34th St., New York 1.

YOUR Abilities needed in booming California industry! Act today! Send $1.00 for your employment lists: Services, Box 561, Oakland, California.

JOBS overseas. Construction, other big time jobs. Pay up to $1500 monthly plus bonus, travel allowance. Venezuela, Canada, Alaska. Get in on these. Expert advice, where, how to apply. Send $2 (COD orders mailed) for full details. Free consultation. Extra services. Jaconn Employment Research, 3300 West Second, Wichita 12, Kansas.

FOREIGN Jobs—Latin America, Alaska, Canada, up to $1500 monthly. Up-to-date 1958 Foreign Service Directory gives complete information, hot list of firms hiring for Military and Civilian Construction, Aircraft, Oil, Exporters-Importers, Mining. How-When-Where to apply. 11th Successful year. $1.00. Global Reports, Box 3873-P, Los Angeles 8, California.

HIGH Paying Jobs, Opportunities, foreign, USA. All trades. Companies pay fare. For information write Dept. 61L, National Employment Information, 1020 Broad, Newark, New Jersey.

JOBS Overseas. Janecek Development Co., 109 Hub Station, New York 55, New York.

"FOREIGN, Alaskan, USA Jobs!! To $1,500.00 Monthly! Million Americans Employed Overseas. Copyrighted Reports. Who to Contact for Highest Paying Jobs! Laborers—Trades—Drivers—Office—Engineers—Many Others. 52 Countries—Booming West—Latin America—Spain—Europe —All Continents. Registration-Advisory Service. Application Forms. Unconditional Money-Back Guarantee! $2.00 (Airmailed $2.25) (COD's Accepted). International Reporter, St. Louis 1-SD, Missouri.

FLORIDA jobs pay big. Special copyrighted analysis airmailed $2.00. Free contacts. Sun-Glo Service, Perry 14, Florida.

COMING to California? 15 Page Booklet, Jobs, Housing, Opportunities, + Free State Map! $1.00. Chesleys, 3977½ Texas Street, San Diego 4, California.

JOBS Galore. Big Pay. Individual Professional Bartenders Instruction. Management, 567 Fairway Ter., Phila., 28, Pa.

43 AGENTS WANTED

MEN—Women Agents: Sensational new moneymakers — Beautifully hand-painted plastic personalized photo enlargements, compacts, rings, bracelets, lockets, etc. Simply take orders, pocket 40% commission—we deliver and collect. Sales outfit free. Novelco, 3343 North Avenue, Chicago 47.

YOUR own business—Suits $1.50; Overcoats 65c; Mackinaws 35c; Shoes 12½c; Ladies' Coats 30c; Dresses 15c; Enormous profits. Catalog Free. Nathan Portnoy Associates, 605-J West 12th Place, Chicago 7.

AGENTS—300% profit selling genuine gold window letters; stores and offices. Free samples. Metallic Sign Letter Co., 1217-E West Newport, Chicago.

EVERY man a prospect. Request free sales kit showing line of belt buckles, individualized with customer's name and emblems also cap badges for trucking, bus, taxi, police, firemen. Choice 3000 emblems. Hook-Fast, Box 1425PS, Providence, Rhode Island.

FREE Sample! Beautiful Feather Pictures. Sylvial, Apartado 9036, Mexico 1, D. F.

GOLD or Silver letters, numbers, Windows, Doors, Trucks 1" to 6". 500% Profits—Free Samples. Atlas-U, 544 West 79th, Chicago 20.

MONEY-Making Opportunity! Take big profit orders for world famous Patented Varieties Fruit Trees. Also Flowering Shrubs, Roses, Vines. Big Sales outfit Free. Stark Bro's. Desk 30128, Louisiana, Missouri.

BUY 800,000 articles direct from manufacturers the world over at lowest prices. Make up to 1000% profit! Free Literature. Glass, Ellwood City 11, Pa.

$1,000.00 A month for making dramatic 3-second demonstration of amazing lightweight Presto Fire Extinguisher. New chemical used by airforce snuffs out fires instantly. Only $4.95. Terrific commissions. Millions want it. Free Kit. Merlite, 114 E. 32nd, Dept. P-66F, New York 16.

GOLDMINE of 600 money-makers. Free copy. Specialty Salesman Magazine, Desk 6B, 307 North Michigan, Chicago 1, Ill.

ANYONE Can Sell famous Hoover Uniforms for beauty shops, waitresses, nurses, doctors, others. All popular miracle fabrics—nylon, dacron. Exclusive styles, top quality. Big cash income now, real future. Equipment free. Hoover, Dept. B-101, New York 11, N. Y.

AMAZING Greeting Card Money-Maker —Make $75.00 on 100 Deluxe $1.25 Assortments. Newest 21 for $1.00 Tall Cards, Gift Novelties. 133 fast sellers. Gift Bonuses besides biggest profits. Experience unnecessary. Stationery samples Free, others on approval. $1.25 Gift for prompt action. Creative Cards, 4401 Cermak, Dept. 515-H, Chicago 23.

EARN Big Money Full or Part-Time. Quickie Spray shines all leather instantly without buffing, brushing. First! Rush refundable $1.00 for demonstrator, selling kit. Franchises available. James B. Barnet Co., Dept. PS-28, Wellesley Hills 81, Mass.

CASH commissions at once, taking orders for magazines every family wants! No experience needed. For Free money-making kit, with everything you need, write McGregor Magazine Agency, Dept. 330, Mount Morris, Ill.

GET New Shirt Outfit Free: make $90.00 weekly on 5 average orders a day. Famous quality Made-To-Measure dress and sport shirts at $3.95 up sell fast to all men. No experience needed. Full or part time. Write: Packard Shirt Co., Dept. 643, Terre Haute, Indiana.

AMAZING new liquid discovery mends, repairs fabrics of all kinds in 60 seconds. Astounding demonstration. Everyone buys. Free Sample Offer. Write No-Sew, Dept. PS-2, 330 South Wells, Chicago 6, Illinois.

SHINE cars without "Polish." New invention. Lightning seller. Cars gleam like mirror. Samples sent on trial. Kristee 78, Akron, Ohio.

START Your Own Business with Rolit Knife sharpener. Sells easily to stores, homes . . . full or part-time. High profits, easy to use, safe, effective, guaranteed. Territories protected. Free Profit Pile Outline. Alden Speare's Sons Co., Dept. 28, 134 Sixth Street, Cambridge, Mass.

IF you're interested in making money in selling, see the hundreds of exceptional opportunities in Salesmen's Opportunity Magazine. Send name for your copy, absolutely free. Tell us what you're selling now. Opportunity, 848 N. Dearborn, Dept. 18, Chicago 10, Illinois.

IT'S easy to sell our big line business printing, calendars, advertising specialties and political advertising. Big cash commission each sale, even first day. Full or part time. Experience unnecessary. Prospects unlimited. Big sales kit free. National Press, Dept. 7, North Chicago, Illinois.

BIG profits fast. Low cost premier English Chamois scoop market. Chamtana, Hudson Falls, N. Y.

WILL you wear new suits and topcoats without one penny cost and agree to show them to friends? You can make up to $30.00 in a day even in spare time, without canvassing. J. C. Field & Son, Inc., Dept. U1826, Harrison & Throop Sts., Chicago 7, Illinois.

60% PROFIT On Cosmetics—Famous nationally advertised Hollywood Cosmetics pay 60%! Make $25-day up! Hire others. For free samples, details, write Studio Girl, Glendale, California, Dept. 1182G.

AMAZING discovery, Master Glase, puts brilliant glase like surface on cars. Free Sample, information. Big commissions. Master Glase, Dept. 884, 7720 Harwood, Milwaukee, Wisconsin.

CALENDARS. Advertising Novelties, Matches. All styles, including Religious. Varnished 12 sheet. Girls. Hundreds of Advertising Novelties, Book Matches, etc. Fleming Calendar Co., Promotional Division, 6539 Cottage Grove, Chicago 37, Ill.

I'LL send you free stocking sample newest advancement in hosiery since discovery of nylon. Patented full-length; stays up without supporters amazingly comfortable. Nationally advertised price $1.95. Make money fast introducing to friends at $1.00 pair. American Mills, Dept. 643, Indianapolis, Indiana.

SEEKING new products? Get my outfit 47 money-making specialties. Latest conveniences for home, car. Send no money. Just your name. Kristee 77, Akron, Ohio.

STEADY Big Profits in Nationally Advertised Unbreakable Plastic Housewares, Tablecovers, Drapes, Utility Covers. Free Catalog PS82. Acclaim, Box 4, New York 40, New York.

BUSINESS of your own. Earning potential as high as $40,000 annually. Issued on $12,500 base. No merchandise to buy. Send for free explanatory booklet. Harrell & Company, Box 8-DD, Louisville, Ill.

WHOLESALE Clothing Catalog Plus Real Merchandise Samples. Bostonian, 14-D Dock Square, Boston 8, Mass.

AUTOMOBILE Specialty Salesmen: Patented Davis Ball Boot Protects Drive Line Parts and Transmission. Saves Repair Bills. Saves Lubricant. Every Chevrolet and Ford Owner, Every Garage and Parts Dealer a Logical Prospect. Attractive, Exclusive Territories Now Open. Write for Details. Davis Ball Boot Company, Inc., 2305 Yale Street, Houston, Texas.

WORLD'S Tiniest Radio. Real Deal. Dealers Wanted. Radio, P. O. Box 20739, Los Angeles 6, California.

EASY handwork makes fast-selling articles. Sample free. Sunmade Company, Brockton 64, Massachusetts.

$1.00 PROFIT selling $2.95 photo enlargement offer. Allen Studio, Reigler Bldg., Little Rock, Arkansas.

44 HIGH-GRADE SALESMEN

MAKE Extra Money. Cash commissions. Everybody buys easy-to-sell Advertising Book Matches. Union Label. Big variety—Glamour Girls, Scenics, Hillbillies. Powerhouse selling kit. Free. Steady repeat-business. No experience necessary. Superior Match Company, Dept. P-258, 7528 S. Greenwood, Chicago 19.

$1,000.00 A month for making dramatic 3-second demonstration of amazing lightweight Presto Fire Extinguisher. New chemical used by airforce snuffs out fires instantly. Only $4.95. Terrific commissions. Millions want it. Free Kit. Merlite, 114 E. 32nd, Dept. P-66F, New York 16.

AD Matches! Sell amazing designs—10, 20, 30, 40, and 240-light book matches. Bigger spot cash commissions; every business a prospect. Low prices for high quality. Repeats. Start without experience; men, women; full, part-time. Buy nothing. Sales kit furnished. Match Corp., Dept. PS-93, Chicago 32, Illinois.

BUSINESS kit free! Postcard puts you in business! Complete line 230 shoe styles, also jackets! New discoveries pay big commissions. No investment. Send for free kit. Mason, Chippewa Falls 72, Wisconsin.

2 CENT postcard puts you in $10,000 business . . . on 3 sales a day! Offer universally wanted product not sold in stores! We train. Mail card for money-making plan. Box 2651, Dept. 1313, Charlotte, N.C.

ABUNDAVITA Means Better Living, Bigger Bank Balances! Campo, 391B Grand, Long Beach 14, California.

WANTED. Part Time Fire Extinguisher Salesman. Out-O-Matic, 1737F E. 31st, Denver 5, Colorado.

BIG Moneymaking Opportunity. Exclusive line uniforms, jackets, pants, shirts, coveralls, sportwear. Advertising embroidered. Every business prospect. Get Selling Outfit Free! Master Co., Dept. F-23, Ligonier, Indiana.

45 EDUCATIONAL & INSTRUCTION

COMPLETE Your High School at home in spare time with 61-year-old school. Texts furnished. No classes. Diploma. Information booklet free. American School, Dept. X246, Drexel at 58th, Chicago 37, Illinois.

EARN Degree. Free bulletin. Homestudy only. Midwestern Bible School, 1060 Broadripple, Indianapolis.

SHORTHAND in four days. Learn at home. $2.98 ppd. Take notes three times faster. Fineline Company, 303-P Fifth Avenue, New York 16, N. Y. Free literature available.

USED Correspondence Courses and Books sold and rented. Money back guarantee. Catalog free. (Courses Bought.) Lee Mountain, Pisgah, Alabama.

BE a Real Estate Broker. Study at Home. Write for Free book today. GI approved. Weaver School of Real Estate, 2018R Grand, Kansas City, Mo.

EARN While You Learn Auto and Diesel Mechanics. Master this top paying trade. Many graduates earn $100 a week and up. Approved for Korean veterans. For free information write Dept. No. 262, Nashville Auto-Diesel College, Nashville 3, Tenn.

STUDY For Doctor's degree of Psychology, Metaphysics and Divinity. Correspondence courses only. College of Divine Metaphysics, Dept. P-S 2811 North Illinois, Indianapolis 8, Ind.

HIGH School diploma at home. Licensed teachers. Approved materials. Southern States Academy, Box 5344-PX, Station E, Atlanta, Georgia.

WANT a Diesel Job? New Opportunities to increase income. Higher Pay, More Money. We can help you Qualify. Tools Shop method home training. Write today! Diesel, Tractor, Heavy Equipment Division, Interstate Training Service, Dept. B-2, Portland 13, Oregon.

ENGINEERING Degrees earned through Home Study. Pacific International University, (operating as a College of Engineering only at present) 5719-A Santa Monica Boulevard, Hollywood 38, California.

LEARN While Asleep! Details Free. Research Association, Box 610-K, Omaha.

BOOKKEEPERS! Increase your earnings! Operate your own simplified "Dollar-A-Week" Bookkeeping and Tax Service. Full or spare time. Details Free. No obligation. Ellis, Box 203, Cedar Grove, North Carolina.

SIMPLIFIED analytics teach algebra clearly—$2; guaranteed. I-6123 Orchard, Dearborn, Michigan.

WELDERS earn big money. Easy to learn Arc—Gas—Automatic Welding. New equipment, low cost training in non-profit school GI Approved. Free Booklet. Hobart Welding School, Box P-281, Troy, Ohio.

FINISH High School at home, spare time. No classes. Diploma awarded. Write for Free catalog. Wayne School, Catalog HBA-75, 2527 Sheffield, Chicago 14.

MATHEMATICS. Universal Correspondence School of Mathematics, Box 5225, Philadelphia 26, Pa.

SCORE high on college entrance examinations. Prepare quickly with genuine Cramwell practice test, only $2.00, ppd. Cramwell, PS7, Adams, Mass.

PIANO Tuning pays. Big money in spare time. Learn at home in 30 days. No musical knowledge necessary. Phonograph, records, tools and instructions furnished. Personal instructions available. Free catalog. Capital Tuning School, 3160 S.W. 16th Court, Fort Lauderdale, Florida.

WATCHMAKING—Jewelry Home Study Courses. Greatest Deal! Watchealing Institute, Culver City, California.

MEN wanted age 19 to 45 to train as Builders, Estimators & Contractors at home in spare time. Big pay opportunities. Write for Free brochure. American Technical Society, 850 E. 58th St., Dept. PS-582, Chicago 37, Illinois.

LEARN Body Fender repair including carburetor—ignition tuneup at home, spare time. Big money trade includes welding, spray painting, metal work. Write for Free information. Utilities Inst., Dept. XM-31, 2525 Sheffield, Chicago 14.

IT'S fun learning a language by Linguaphone. World's Standard Conversational Method. At home, quickly, easily, learn to speak French, Spanish, German, Japanese, Russian, Modern Greek—your choice of 34 languages. It's like living in another country. Complete recorded courses on Free trial. Send for Free book and Details. No Obligation. Try, don't buy! Linguaphone Institute, T-54-028 Radio City, New York 20.

IMPROVE your singing! Valuable explanatory thesis $1.00 postpaid. Address Cramer, P.O. Box 3592, Glendale 1, California.

BIBLE study courses by mail, certificates. Box 235P, Brea, Calif.

VOCATIONAL Analysis Questionnaire Free. Write 10729 Francis Place, Los Angeles 34, Calif.

LEARN! Dance! Right away! Free "Automatic Instructor" proves you can! Castle's Homestudy, 507 Fifth Avenue, New York City 17.

JOIN Science Parade. Learn Electrical Drafting. Easily Understood. High Pay. Low Cost Course. Thomas, Box 154, Concord 1, New Hampshire.

LEARN Real Estate—Study at home. Send for free catalogue. Midwest School of Real Estate, 68 North Chicago Street, Joliet, Illinois.

"HYPNOSIS Unawares." Influence others while they sleep! Complete instructions by Ph.D.—$5.00. Satisfaction guaranteed. Wade Hampton, 1320 Micheltorena, Los Angeles 26, California.

EARN Diplomas, Certificates, Degrees—Specify Interests. Specialty, Box 296, Jacksonville, Illinois.

A Dynamic Singing and Speaking Voice can be yours! Self-Training records. Thrilling details! Canfield, 2018-C Fifth Avenue South, Minneapolis 4, Minnesota.

SELF-help Center: Answers Any Psychological Problem. 50,000 Medical, Psychiatric, Scientific Resources. $1.00. Clinic, 1320 Hunting Park, Phila., Pa.

GET Credit for What You Know. Educational Testing, Administered in Your Locality. Engineering, Business, General Studies. Free Details. Cramwell Research Institute, Inc., Adams 1, Massachusetts.

100,000 AUTOMOBILE Mechanics Needed—Steady Employment. Good Pay. Basic Course $1.00. Di-Val, Box 43, Orange, Calif.

WE Pay $3.50 lb. dried. Grow Mushrooms. Cellar, shed and outdoors. Spare, full time, year round. We have 25,000 customers. Free Book. Washington Mushroom Ind., Dept. 180, 2954 Admiral Way, Seattle, Wash.

EARN College Degrees, Correspondence. Metropolitan University, Box 86, Glendale, California.

LEARN Piano Tuning Easily At Home. Our Graduates lead field. Our 60th year. Free Booklet. Niles Bryant School, Dept. S, 3711 Stockton Blvd., Sacramento 20, California.

COMFORTABLE Living for Life! Operate your own Independent Simple Business Analysis, Bookkeeping, Tax Service. Full or Spare Time. Details Free. Vanderdrift, 35D Franklin, East Orange, New Jersey.

PHYSICAL Therapy and Massage. Home Training. Practice privately or work with doctors and hospitals. Free Catalogue. National Institute, Box 4, 159 E. Ontario, Chicago, Illinois.

EARN Degree From College Abroad. Taking Test. No Travelling. Numerous Fields. Aures, Central Valley, New York.

SALESMEN! Guaranteed increase in closures. $1.00. Educational Sales Presentation. P.O. Box 1820-P, San Francisco, California.

USED Correspondence Courses, Educational Books Bought, Sold. Catalog Free. Vernon, Trion, Ga.

FREE: "Your Amazing Subconscious"; Six steps to Success. Box 847 (A-2), Ocean Park, Calif.

HELP yourself to abundant living. Our courses have aided students to richer, fuller lives. Learn secret of contentment, happiness. Earn degrees PsD, MsD. Write for free book. College of Universal Truth (Correspondence School), 23-K E. Jackson, Chicago.

46 CONTESTS

WIN contest money. General Contest Bulletin gives hundreds of tips. Lists current contests, rules. Sample magazine 25c. General Contests, 1609-A East 5th, Duluth, Minnesota.

CONTESTS—Helps. Over 50 People Won with My Help. United, 25 Earl, Red Bank, N. J.

PRIZE Contests! Fabulous Home Income Opportunity! How and Where to Win Your Share! Latest Contest Books! Send Stamp! National Contest Bulletin, Box 2685-PS, Miami 16, Florida.

47 DETECTIVES

LEARN Civil and criminal investigation at home. Earn steady good pay. Institute Applied Science, 1920 Sunnyside, Dept. 332, Chicago 40, Ill.

DETECTIVES—Work home—Travel. Experience unnecessary. Detective Particulars free. Write Wagoner, P-125 West 86th, New York 24.

INVENTORS Don't sell your invention Patented or Unpatented until you receive our offer, write Cowgill, Box 298, Marion, Ohio.

INVENTORS: If you have an invention

FREE Shellcraft catalog, instruction book 35c. "Secor's," Bradenton Beach, Florida P.S.

LEARN Art Metalcraft and jewelry mak-

MAKE paint stick to metal with "Metal Treat." $1.00 bottle makes a gallon. At leading hardware and paint stores or prepaid from Klean-Strip Co., P.O. Box 10084-C, Memphis, Tenn.

DETECTIVE Training. Phillips Secret Service System, 1917-C North Kenneth, Chicago 39, Ill.

BE A Detective. Write for free details. State Age. National Detective Academy, Dept. A, P. O. Box 1062, Scottsdale, Arizona.

50 BUSINESS SERVICE, INFORMATION, NAME LISTS

WOMEN Mail Buyers Names $5.00 Thousand. Durite, 2524 North N.J., Indianapolis 5, Ind.

OPPORTUNITY Seekers, Women Mail Buyers Names, $6.00, Thousand. Sullivan, 3410 West 47th, Gary, Indiana.

FLORIDA Homeowners 1c Each. Gummed Labels. Any Quantity. P. H. Enterprises, 4914 Cortez Drive, Orlando, Fla.

52 AUTHORS SERVICE

WANT Your Book Published? Learn how we publish, advertise, promote, distribute. Many successes. Free booklet PS. Vantage, 120 West 31, New York.

WRITERS: Book Manuscripts invited for publication on our cooperative plan. Greenwich Book Publishers, (Atten. Mr. Ibsen), 489 Fifth Avenue, New York 17, New York.

53 ADVERTISING, AGENCIES, ETC., FOR ADVERTISERS

FREE expert assistance for mailorder advertisers. Ratebook leading newspapers, magazines, 10c. Chicago Advertising Agency, Chicago 4.

ADVERTISE: 24 words, 100 Canadian Newspapers, $5.50. Lists Free. Advertising Bureau, 10511-F Springfield, Chicago 43.

54 CARTOONING, SIGN PAINTING, CHALK TALKS

"HOW To Make Money With Simple Cartoons"—A book everyone who likes to draw should have. It is free, no obligation. Simply address: Cartoonists' Exchange, Dept. 192-C, Pleasant Hill, Ohio.

CARTOON your way to success! Internationally known instructor, Raye Burns, will personally teach you to create original, salable cartoons at home. Cost of course is very low. Write for free details. Raye Burns School, Box 3583-S, Cleveland 18, Ohio.

SIGN Painting—Lessons By Mail. Books On Lettering, Gold Leaf, Show Cards, Pictorial. Write Sign Instruction, 4304 Virginia, Kansas City 10, Missouri.

CARTOONISTS' Magazine. Lessons, Markets, Free Sample. Cartoonists, 2776 California Court, Lincoln 10, Nebraska.

YOU can Entertain with Chalk Talks. Catalog 10c. Cartoonist Balda, Oshkosh, Wisconsin.

PAINT Signs—Master die cut, outline letter patterns. Complete assortment, 1½" to 12" high, prepaid $2.00. Eyerly, P-583, Newton, Iowa.

55 TYPEWRITERS & OFFICE MACHINES

TYPEWRITER Adding Machine Bargains! Free List. Woods Typewriters, Bedford, Pennsylvania.

56 RUBBER STAMPS & OFFICE SUPPLIES

THREE line name and Address. Metal or plastic pocket Case $1.00. Mated Mailers. Post Office Box 494, Buffalo 5, New York.

3 LINE 2 inch knob handle cushion mount, indexed $1.98, catalog 25c, refundable. Nelsons', Box 412, Oskaloosa, Iowa.

THREE line cushioned stamp $1.00. Eldredge Industries, 152 Rosemont Avenue, Trenton 8, N. J.

DELUXE Indexed Stamps. Name and Address $1.50. Catalog 25c. Bruce's, Box 516, Franklin, Louisiana.

3 LINES $1.00. 4 or 5 lines $1.50. (Any Wording, Any Lines.) Roughsedge's, 2 Lionel, Clark, New Jersey.

NAME Address 3 Lines $1.00. Owens, 4503 Firnat, Houston 16, Texas.

INDEXED Cushioned 3 Lines $1.00, 4 Or 5 Lines $1.50. (Script or Print) Free Stock Stamp Circular. 1 Day Service. Youngers Stamp Shop, Princeton, Iowa.

NAME, Address $1.00. Free Catalog. Stanley's, 79 Golf, Methuen, Mass.

57 PRINTING, MULTIGRAPHING, ETC.

OFFSET Booklet Printing. 5 M, 8 page bklt, 5½x8½ bound $73.00. 5 M, 8 page bklt, 8½x11 bound $120.00. 5 M 12 page bklt 7½x8½ bound $135.00. Copen Press, 105 Court St., Brooklyn.

1,000 BUSINESS Cards, "Raised Letters" $3.50. Samples. Pioneer, Island Park 23, New York.

FINEST printing—lowest prices! Bargain catalogue—Decco, Box 3315-S, St. Louis 3.

MIMEOGRAPHING, Printing. Quality Work, Reasonable Prices. Prajlimdot, Formerly Currier, New Lebanon Center, N. Y.

PRINTING Photo-offset, Letterpress, Mimeographing. Samples free. Litho, Madison 6, Tennessee.

OFFSET Printing—$6.75 1000. 8½x11; 24 hour service. National Letters, 251 West 42 St. New York 36, New York.

BUSINESS, Personal Printing—Labels, Rubber Stamps, Accessories. Illustrated Catalog, Free! Brose, 196-B, Clerk, Jersey City 5, N. J.

500 ¾x2¼ FOUR line gummed stickers 50c. Red Border $1.00. Moritz Printer, Saginaw, Michigan.

FREE Catalog. Postpaid Printing. D M Press, Sebastopol, California.

58 PRINTING OUTFITS, SUPPLIES

DO your own printing. Save money. Simple rules. We supply everything. Print for others, good profit. Raised printing like engraving too. Have home shop. Details free. Kelsey Presses, V-8, Meriden, Conn.

PRINTING Presses, Type Supplies. Lists 3c. Turnbaugh Service, Mechanicsburg, Pa.

RUBBER Stamp making presses, hydraulic operated, electrically heated. Sizes 5"x8", 8"x12", 10"x15" starting outfits. All kinds supplies. Custom Manufacturing. 601 N. Jefferson, Springfield 2, Missouri.

MAKE Your Own self-molding rubber stamps and printing cuts. Plexirubber, Argyle 2, Wisconsin.

59 PATENT ATTORNEYS

C. A. Snow & Co.—S-427, Snow Building, Washington 1, D. C. Registered Patent Attorneys. Write for information.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent. John Randolph, Registered Patent Attorney, 207 Columbian Bldg., Washington 1, D. C.

INVENTION Record form free and "Patent Information Every Inventor Should Have." Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

INVENTORS — Take these preliminary steps toward patent protection. Sketch and describe your invention. Sign, date and have this disclosure witnessed by two people who understand your invention. Have us make a preliminary search among U.S. patents already granted for similar types of invention. We report on the probable patentability of your invention and recommend your further course of action. Write for our instructive booklet, "Patent Protection for Inventors" and convenient "Evidence of Invention" disclosure form. Victor J. Evans & Co., 441-B Merlin Building, Washington 6, D. C.

INVENTORS: Learn how to protect your invention. Unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and prepared to serve you in handling your patent matters. "Patent Guide for the Inventor" containing detailed information concerning patent protection and procedure with "Record of Invention" form will be forwarded to you upon request—without obligation. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 82B-A District National Building, Washington, D. C.

INVENTORS—If you believe you have an invention, you should find out how to protect it. The firm of McMorrow, Berman & Davidson, with offices in Washington, D.C., is qualified to take the necessary steps for you. Send for copy of our Patent Booklet "How to Protect Your Invention." We will also send you an "Invention Record" form. No obligation. They are yours for the asking. McMorrow, Berman & Davidson, Registered Patent Attorneys, 143-A Victor Building, Washington 1, D.C.

"INVENTOR'S Guide" and "Record of Invention" free on request. Frank B. Ledermann, 154 Nassau Street, New York City.

60 FOR INVENTORS

INVENTORS—Send for free Patent Information book and Inventor's Record. Registered Patent Attorney, Associate Examiner, Patent Office 1922-1929; Patent Attorney & Advisor, Navy Department 1930-1947. Gustave Miller, 28PSI Warner Building, Washington 4, D. C.

INVENTORS, If you have an invention for sale, patented or unpatented, write Institute of American Inventors, Dept. 30A, 635-F St., N.W., Washington 4, D. C.

INVENTORS—This firm is registered to practice before the United States Patent Office and available to assist you in the preparation and prosecution of your patent application. "Patent Protection for Inventors" booklet containing detailed information and steps to take toward patent protection sent promptly upon request. No obligation. Victor J. Evans & Co., 442-B Merlin Building, Washington 6, D. C.

INVENTION Record form free and "Patent Information Every Inventor Should Have." Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent on your invention. Joan Randolph, Registered Patent Attorney, 206 Columbian Bldg., Washington 1, D. C.

INVENTORS Don't sell your invention Patented or Unpatented until you receive our offer, write Cowgill, Box 298, Marion, Ohio.

INVENTORS: Learn how to protect your invention. Unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and prepared to serve you in handling your patent matters. "Patent Guide for the Inventor" containing detailed information concerning patent protection and procedure with "Record of Invention" form will be forwarded to you upon request—without obligation. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 82A-A District National Building, Washington, D. C.

INVENTIONS wanted now by my Manufacturer—Clients. Patented. Unpatented. Write Gilbert Adams, Patent Broker, 80-B Wall Street, Financial District, New York City.

GET your invention on the Market. You will meet manufacturers looking for new products at the International Gadget Show. Write to International Gadget Show, Inventors Div., 304 East 23rd Street, N.Y.C.

INVENTORS—If you believe you have an invention, you should find out how to protect it. The firm of McMorrow, Berman & Davidson with offices in Washington, D.C., is qualified to take the necessary steps for you. Send for copy of our Patent Booklet "How to Protect Your Invention." We will also send you an "Invention Record" form. No obligation. They are yours for the asking. McMorrow, Berman & Davidson, Registered Patent Attorneys, 1439 Victor Building, Washington 1, D.C.

INVENTORS! Have you good patentable ideas? Write Mr. Metzlerr, 11 West 42nd, New York.

INVENTIONS protected without Patents. Tekservice, 282 Woodcliff Station, North Bergen, N.J.

LICENSE your ideas: Forms 3/$1.00. 427W Lynwood, San Antonio 12, Texas.

PATENT Searches including copies of nearest patents, $6.00. Reports airmailed within 48 hours. More than 100 registered patent attorneys use my service. For Free invention protection forms, write Miss Ann Hastings, P.O. Box 176, Washington 4, D. C.

"INVENTOR'S Guide" and "Record of Invention" Free on Request. Frank B. Ledermann, 154 Nassau Street, New York City.

PATENT Searches $5.00. 48-hour airmail service. Invention Protection forms free. Write Patent Engineering Service, 711 14th Street N.W., Washington 5, D.C.

PATENT Searches $5.00. 48-hour service. Free Invention Protection forms. Write Raymond L. Smith, Patent Searcher, 626 Sheraton Building, Washington 5, D. C.

61 INVENTIONS WANTED

INVENTIONS wanted. Patented; unpatented. Tremendous Manufacturers lists. Global Marketing Service, 2420 77th, Oakland 5, Calif.

INVENTORS: Hundreds of manufacturers have requested our assistance in locating marketable new products. Complete information free. Institute of American Inventors, Dept. 30C, 635-F Street, N. W., Washington 4, D. C.

INVENTIONS wanted now by my Manufacturer—Clients. Patented. Unpatented. Write Gilbert Adams, Patent Broker, 80-R Wall Street, Financial District, New York City.

INVENTORS Don't sell your invention Patented or Unpatented until you receive our offer, write Cowgill, Box 298, Marion, Ohio.

INVENTORS: If you have an invention for sale, patented or unpatented, write for free brochure outlining manufacturers' requirements, royalty rates. Kessler Corporation, 721W, Fremont, Ohio.

INVENTIONS Wanted: "Patented"—"Patent Pending" 27 years experience Promoting Inventions. National Service Bureau, 3122 Meramec, St. Louis 18, Mo.

SELL or License Your Invention, Show it in America's Largest Invention Catalogue Serving Manufacturers, Write Publishers: A. J. Murphy & Associates, 681 Market Street, San Francisco 5, California.

ATTENTION Inventors! We extend our invitation to exhibit your invention at the largest International Inventors Exhibition being held during the 1958 World's Fair at Brussels, Belgium. Non-Profit world-wide market facilities. Contact Otto Witt, Official American Correspondent, Box 1481, Milwaukee 1, Wisc.

SUPERIOR promotions. Patented, unpatented inventions. Informative booklet, free. Superior, 338-342 North Rodeo, Beverly Hills, California.

64 MODELS, MODEL SUPPLIES

LIONEL Trains. Big Discounts. Bulletin Free. Catalog, 25c. Mack Brothers, 2041 Chicago Ave., Chicago 22.

SHIP and yacht model fittings; blueprints. Send 35c for illustrated catalog #29 listing hundreds of items. A. J. Fisher, 1002-2 Etowah Ave., Royal Oak, Michigan.

SHIP Models. Most complete line in New England. Kits, fittings, plans, books, tools, engines, motors. 1958 illustrated catalog 35c. James Bliss and Co., Inc., Dept. PS, 342 Atlantic Avenue, Boston 10, Massachusetts.

MODEL Ship Kits, Fittings and Plans Including Clippers, Trawler, Fishermen, Frigates, Privateer, etc. Towboat of 1900 for HO Gauge $3.95. New 1958 Catalog 25c. Model Shipways, Box 85, Bogota, N.J.

"ST" Steam engine castings, fittings, boat plans catalog 15c. Ship Models Ltd., 186 Summer, Andover, Mass.

POWER Models. Unusual Steam, Gasoline and Traction Engines, Fittings, Metals. New Comprehensive Catalog $1.00. Charles Cole, Ventura, Calif.

ROCKET Plans Simplified. One Dollar. Model Rocket Society, Deerwood, Minnesota.

STEAM engines, boilers, castings. Catalog 25c. Anton Bohaboy, 2297 Price, Rahway, N. J.

MINIATURE Engines: Gasoline and Steam. Build Them on Your 6" or 9" Lathe. Illustrated Catalog, Listing Castings, Blueprints, Fittings, etc., Only 10c. Octura Models, P.O. Box 536-PS, Park Ridge, Illinois.

ROCKETS—Build Your Own Working Models. 1 and 2 Stage. Full Details on Construction, Fuels, etc. $1.00. 2420 Blossom, Columbia, South Carolina.

JUMBO Modelcraft Catalogs: Airplanes, Boats, Cars—25c. Railroad—25c. 10,000 Items. Bargains List Free. America's Hobby Center, 146L West 22nd Street, New York 11, New York.

65 HOME CRAFTSMAN

ALL Crafts, Supplies. Large Free Catalog. National Handicraft, 199 William St., New York 38.

WOODWORKING and Cabinetmaking course for beginning and advanced home craftsmen. Only complete low-cost home training program available. Write for free booklet. Interstate Training Service, Dept. G-2, Portland 13, Oregon.

FREE. New big illustrated catalog. Leathercraft, Metalcraft, Woodcraft kits and supplies. Complete stock, top values, latest ideas. Write today. J. C. Larson Co., Dept. 7726, 820 S. Tripp, Chicago 24.

OVER 900 Woodworking projects. Books and patterns. Free catalog. Craftsman, 115-C Worth Street, New York City 13.

FREE "Do-It-Yourself" Leathercraft Catalog. Tandy Leather Company, Box 791 E25, Fort Worth, Texas.

101 PATTERNS of smart gifts, novelties, shelves, action windmills. Plus "Make Money Jig Sawing." $1.00. Mastercraft, 25S, 7041 Olcott, Chicago 31, Illinois.

SQUAREKNOTTERS: Make belts, handbags, lanyards, dog leashes, etc. Special offer! Beginner's book, catalog and quality cord samples 25c. P. C. Herwig Co., Dept. 71-P7, 39 Henry St., Brooklyn 1, New York.

102 SMALL Woodworking Projects. $1. Eldon, 440 E. 44 Ave., Vancouver, B. C.

FREE Shellcraft catalog, instruction book 35c. "Secor's," Bradenton Beach, Florida P.S.

LEARN Art Metalcraft and jewelry making. Complete, inexpensive, home training course now available. Special tools and materials furnished. Write for free booklet. Interstate Training Service, Dept. L-2, Portland 13, Oregon.

FREE Catalog. 2150 Artist-drawn Patterns, Designs. Craftplans, 1322-B Wabash, Chicago 5.

ASSEMBLE fluorescent fixtures from inexpensive kits. Catalog 10c. Shoplite, 6508 Franklin Ave., Nutley 10, New Jersey.

AMERICA'S most complete Home Craft supply company. Send 10c for big colored catalog. Giles Kendall Company, Huntsville, Alabama.

FREE Leathercraft Catalog. Kirkpatrick Leather Co., Box 637-A4, Gainesville, Texas.

LEATHERCRAFT Quality leather tools kits complete catalog 25c refundable. Midas, Box 1255, Dept. R8, Huntington Park, California.

KNOCKDOWN cedar chest and lumber free price list. Bedford Lumber Company, Shelbyville, Tennessee.

WOODCRAFTERS—We Buy What You Make From Our Patterns! Easy to Make, No Special Tools Needed—Send $1.00 For Patterns and Complete Instructions—Satisfaction Guaranteed. Wm. Rice, 87 Washington Ave., Kingston 10, N. Y.

STYLECRAFT "Pretraced" leather kits. Handbags, Billfolds, Filigree Belts. Patterns on leather. Just carve, assemble and lace. "Precarved" kits also available. Send 25c for catalog, free folder. Refunded first order. Apache Leather Company, 2804 E. Washington St., Phoenix, Arizona.

129 FULL-size Artist drawn jigsaw patterns. $1.00. Craftplans, 1322-B Wabash, Chicago 5.

66 DO IT YOURSELF

$1.00 PLANS for rocket. Altitude 1000 feet; 50c construction. William Struve, Carleton College, Northfield, Minnesota.

GRANDFATHER clock movements, barometers, blueprints, kits. Wholesale catalog 25c. Mason-Sullivan, Noroton 2, Connecticut.

BUILD Rotary Tiller and Mower Combined or Separate. Kits and Parts. Mass Production Low Prices. 2½ and 3 H.P. Engines $35.00 and $38.00. Circulars Free. Shaw Du-All (PS), Galesburg, Kansas.

MAGIC 60 Second Fabric Mender. Mends, Repairs Fabrics, Canvas, Upholstery, Leather Goods. Saves Time, Money. Send $1.00. Guaranteed. Macleif, 743-B Sackman, Brooklyn 12, N. Y.

ALUMINUM Carport Kits. Build your own. Details Free! Carports, Box 3063, Shreveport, Louisiana.

BUILDING Plans for Block Homes $1.00. Thompson, P.O. Box 8245, Tampa, Fla.

LAZY-SUSAN Revolving Shelves. Complete Hardware. Free Circular. Endema, Box 6155, Bridgeport 6, Connecticut.

67 OLD GOLD, JEWELRY, WATCHES, ETC.

USED and new watches $2 up. Free List. Southern Watches, 5-PS So. Wabash, Chicago 3.

COSTUME Jewelry Supplies. Settings, Rhinestone, etc. 88 page illustrated catalog, 25c. Milady, Box 1328, G.P.O., New York City (1).

HIGHEST Cash For Old Gold, Broken Jewelry, Gold Teeth, Watches, Diamonds, Silverware, Spectacles, Platinum, Mercury. Free Information. Rose Refiners, Heyworth Bldg., Chicago 2.

HIGHEST Cash Paid for old Gold, Jewelry, Watches, Diamonds, Silver, Gold Teeth. 100% Full Value Paid Immediately. Satisfaction Guaranteed. Mail Articles Today. Information free. Established 1900. Chicago Gold Smelting Co., 6 E. Monroe St., Dept. 257, Chicago 3, Ill.

FREE Illustrated Catalog. Costume Jewelry Parts, Supplies. Folsom's, Box 52, Medford 55, Massachusetts.

68 TOBACCO & PIPES

PIPE Smokers! Write today for free eye-opening facts about smoking. A surprise awaits you. E. A. Carey, Dept. 13-B, Chicago 40.

69 FOR THE HOME

FOAM rubber furniture cushions—Factory seconds 50% discount. Free catalog. Perma-Foam, 390-A Nye Ave., Irvington, New Jersey.

ASSEMBLE natural looking plastic indoor plants from kits. Free information. Arjayco, 1404 Hayden, Cleveland 12, Ohio.

MAKE paint stick to metal with "Metal Treat." $1.00 bottle makes a gallon. At leading hardware and paint stores or prepaid from Klean-Strip Co., P.O. Box 10084-C, Memphis, Tenn.

CESSPOOLS, septic tanks, outdoor toilets, cleaned, deodorized without digging, pumping or moving. Free details. Chemical Cesspool Cleaning Company, Boston 34, Massachusetts.

HANDLE-Jiggler? Aggravated by Those Second Trips to the Bathroom to Stop Toilet from Running? Revolutionary Device Saves Money, Water, Tempers, Too! Tested and Proven by Over 1,000,000 Users. Attach in Seconds. Even Dagwood Could Do It. $1.98 Postpaid. P.O. Box 742, Minneapolis, Minnesota.

NAME Brand Merchandise Catalog. 25 Cents. Batchelle Enterprise, Columbia 3, S. C.

GETTING Married We Trust You Send for Our Circular. Ray Putt, 1640 Dyre St., Philadelphia 24, Pa.

70 OF INTEREST TO WOMEN

GOOD Money In Weaving. Weave rugs at home for neighbors on $89.50 Union Loom. Thousands doing it. Booklet free. Carlcraft Co., Power Street, Boonville, New York.

MAKE $25 to $35 weekly addressing envelopes. Our instructions reveal how. Glenway, Box 6568, Cleveland 1, Ohio.

DRESSES 24c; Shoes 39c; Men's suits $4.95, trousers $1.20. Better used clothing. Free Catalog. Transworld, 164-T Christopher, Brooklyn 12, N. Y.

60% PROFIT On Cosmetics—Famous nationally advertised Hollywood Cosmetics pay 60%! Make $25-day up! Hire others. For free samples, details, write Studio Girl, Glendale, California, Dept. 1182G.

MAKE $75 to $500 spare time showing friends, neighbors, "newest of the new" sensational, exclusive Modern-Design, Studio-Style all occasion Greeting Cards for birthdays, anniversaries, getwell, friendship, etc. Everybody orders. Keep up to 50c on every $1.00. Send no money. 2 beautiful assortments on approval. Rush name. Wallace Brown, 11 E. 26th St., Dept. A-242, New York 10.

$1,000.00-$5,000.00 YEARLY Possible. Addressing Envelopes, Postcards, for Advertisers! Further Information. Free. Mann, 427-C, Woodcliff Lake, N. J.

WE Pay $3.50 lb. dried. Grow Mushrooms. Cellar, shed and outdoors. Spare, full time, year round. We have 25,000 customers. Free Book. Washington Mushroom Ind., Dept. 181, 2954 Admiral Way, Seattle, Wash.

MONEY, Typing—Sewing! Details Free! Edwards, 3912-PS, 12th, Des Moines 13, Iowa.

$200.00 MONTHLY Possible. Sewing Babywear! No house selling! Send stamped, addressed envelope. "Cuties," Warsaw 14, Indiana.

TYPISTS Addressers! Earn at Home. Free Details. "Lists," Box 437-AC, Fort Madison, Iowa.

71 FOR SALE MISCELLANEOUS

WALLETS. Pigskin Calf Morocco Imported Leathers. Box 504, Nyack, New York.

IMPORTED #48 Roller Chain $\frac{1}{2}$x$\frac{1}{2}$" Pitch. $.30 per Foot. Irvine, 5 Laurel Road, Demarest, N. J.

RING-Valve Job while driving. $6.00. Literature. Motaloy, Grantham 27A, Pa.

72 WANTED TO BUY

TOP prices paid for old copies of Popular Science—need only issues from period 1890 to 1915. If books are complete, even though condition is not perfect, please write us and describe what you have. Do not send the issue until you hear from us. Write to Box 308, Tuckahoe, New York.

QUICKSILVER, platinum, silver, gold. Ores analyzed. Mercury Terminal, Norwood, Massachusetts.

75 TATTOOING SUPPLIES

LEARN profitable, fascinating Tattooing. Free illustrated information. Zeis, 728-B Leslie, Rockford, Illinois.

77 GEIGER COUNTERS & TREASURE FINDERS

FIND lost or hidden treasure with new, improved metal detector. No ground pick-up. Also, underwater metal detector. Free literature. Gardiner Electronics, Dept. 1, 2545 E. Indian School Road, Phoenix, Arizona.

GOLD, silver, metal detectors. Geiger counters for uranium. Violites. Sensational new fully guaranteed models. None finer. Information free. Detectron Corp., 5528 Vineland Ave., North Hollywood, Calif.

FREE Literature—Lightweight, guaranteed Metal Detectors. Geiger Counters and Mineralights. Kits and Assembled Models. Electronic Applications, Dept. S, Box 8, Arlington 10, Virginia.

MONEY . . . In Hidden Treasure. Find It . . . With a Goldak Treasure Finder. Send For Free Literature on Complete Line of Mineral & Metal Locators, Underwater Detectors, Etc., Priced as Low as $64.50. In Celebration of Its 25th Year, Goldak Co. Introduces New Transistor Instruments for Greater Sensitivity, Less Weight, Low Cost Flashlight Batteries. Write for Information Today! Goldak Co., 1540 W. Glenoaks Blvd., Glendale, Calif.

78 WATCH REPAIRING

WATCH and clock repairing books. Free catalog. North American, 2320-BP, Milwaukee, Chicago 47, Illinois.

WATCHMAKERS' Tools, Materials, Supplies. Watches. Catalog. Gales, Box 1000, Chicago 90, Illinois.

WATCHMAKERS' Journal. Instructions and other valuable information for watchmakers', students, hobbyists. Sample copy 20c. Dean Co., Box 3218-C, Daytona Beach, Florida.

79 MISCELLANEOUS

STENCIL Kit—Your Name and Address, Ink and Applicator. Easy to Use on Mailbox, Implements, Truck, Tools. Rush $1.00. Kit Sent Promptly Postpaid. Please Print Carefully. Hedger Sign Company, 1219 N. Clinton Street, Decatur, Illinois.

FREE Wholesale Catalogs! Sporting Equipment — Cameras — Homewares — Everything. Econ-O-Mart, Whippany 6, New Jersey.

OUTDOOR Toilets, Cesspools, Septic Tanks cleaned, deodorized with amazing new product. Safe, harmless, easy to use. 150,000 customers your guarantee of satisfaction. Money-back guarantee. Postcard brings Free Trial Offer. Burson Laboratories, Dept. D-22, 951 Willard Ct., Chicago 22, Illinois.

BEAUTIFUL Ball Point Pens, with extra free refills. 50c, 3 for $1.25. Park Products, Box 73, Highland Park, New Jersey.

BIG interesting mails three months 25c, year $1.00. Harvey Teeple, Decatur, Indiana.

SNOW Cone Machines. All Prices And Sizes. Special For Grocery Stores. Box 7803, Dallas, Texas.

FREE Literature — Make Big Money Raising Fishworms and Crickets. Carter Farm-12, Plains, Ga.

THE Bible in Story and Pictures. 2 Volume Set $4.95. Jhal Enterprises, Olanta, South Carolina.

COLLEGE Students, Teachers, will pay Cash for Used or Discarded Research and Term Papers. Topics Unlimited. Collegiate Research, Box 92, Muskegon, Michigan.

GERMAN Cuckoo Clock $2.00. Gray Company, Box 948-PS, Vallejo, Calif.

RECEIVE—Magazine Samples, Mails, Catalogues, Offers From Everywhere. Get Listed 25c. Rorick's, Cincinnati 26, Ohio.

WE Pay $3.50 lb. dried. Grow Mushrooms. Cellar, shed and outdoors. Spare, full time, year round. We have 25,000 customers. Free Book. Washington Mushroom Ind., Dept. 182, 2954 Admiral Way, Seattle, Wash.

TOY Soldiers, Cowboys, Pirates. $1.00 per Hundred. Jhal Enterprises, Olanta, South Carolina.

FABULOUS Opportunities, Pleasing Gifts. 25c. Greyhouse, 7000 Monmouth, Ventnor, N. J.

BUY Wholesale! Over 10,000 Nationally Advertised Products, Appliances, Cameras, Sporting Goods, Housewares, Watches, Typewriters, Tools, Clothing, etc. Send Postcard Today. Buy-Rite, Box 258, Hawthorne 6, New Jersey.

$90.00 DAY Selling Jewelry, Novelties, Jokes, Novels, 10c Items. Free Catalog. Burke Associates, Manchester 2, Mass.

CIGARETTES—Improved roller makes 20 for 9c. Facts free. Moberly, Box 811, Owensboro, Kentucky.

IF you have a product or service that can be operated on a mail order basis, write me today. I will send you a Free Kit on "How To Make Money Out Of Classified Advertising". Next issue will be April. Closing date February 21. Hurry—Do it Today! O. K. Kelly, Classified Adv., Mgr., Dept. 28, 353 Fourth Avenue, New York 10, N. Y.

79A WESTERN MERCHANDISE

FREE Catalog: Western Wear, Saddles, Boots, Leather Supplies, Silver Spur, Box 1785-B25, Fort Worth, Texas.

80 PERSONAL

"HOW Can I Find Out?" You Can! Information confidentially developed. Any matter, person, problem. World-wide. Officially licensed. Established 1922. William Herman, 170 Broadway, New York.

LEARN While Asleep! Details Free. Research Association, Box 610-K, Omaha.

PSORIASIS Sufferers! Discouraged? Write for Free important information today! Pixacol Co., Box 3583-SP, Cleveland 18, Ohio.

DRUGS Sundries Wholesale, Men, Women. Illustrated list 25c coin. P. P. Ally, 1123 Ellicott, Buffalo 9, New York.

MEXICAN Legal Matters. A. Espejo, Box 234-PS, Hermosillo, Sonora, Mexico.

PAY Your Bills Now. Borrow $100.00 to $600.00 Cash by mail. Easy, quick, private. Repay in small monthly installments over 20 months. Your payments may run ½ less than now; have money left over to spend. Loan Order Blank mailed Free in plain envelope. Advise amount needed. State Finance Co., 323 Securities Bldg., Dept. B-227, Omaha 2, Nebr.

BIBLE reveals Time of End! Exact Year, Month, Date sent free! Write: Harvest, Jefferson City 2, Missouri.

HERB Doctor Book. Particulars free. Herbal Products, Quicksburg 8, Virginia.

KNOW Anyone's Weakness. Instructions 25c Coin. Wayne Waldo, Jefferson, Iowa.

"YOUR Chances of Living" computer: $1.00: 427W Lynwood, San Antonio 12, Texas.

LAS VEGAS, Nevada. Largest Gambling Center In World. Six Weeks Divorce, Confidential Remails 25c, $3.00 Mo. Classified $1.00. Unique. Box 1376.

EYE Tiredness? Night blindness? Try "Eye Vite". Months supply $1.50. Willy's Lab. Inc., R-2, Box 420, E. Moline, Ill.

RECEIVING-Forwarding $2.50 Month. Remails 20c. Koerper, 5528 Thrush, St. Louis 20, Missouri.

MIAMI, Florida—Remailing 25c, Monthly rates available. Sunday classified $1.00. Scenic Postcards 12 for $1.00—Sam Lynne, 6635 S.W. 45th St., Miami 55, Fla.

SINGLE? "Numero-Astro Future Marriage Guidance," only $1.00. Box 4, Alton, Ill.

FABULOUS Royal Jelly Capsules. Now Available. Hi-Potency; Dietary Food Supplement. No Doctor's Prescription Necessary. 30 Day Supply $4.95. Satisfaction Guaranteed or Money Refunded in 10 Days. Globe Vitamin Co., Macon 4, Georgia.

WASHINGTON, D. C., Remails 25c. Lanham Enterprises, Box 101, Lanham, Md.

FLORIDA—Opportunities. Classified Ads Mailed—$1.00. Letters Remailed—25c. Divorce Attorney Contact—$1.00. Carnation, Box 1002, Winter Park, Florida.

MEXICAN Law. General Practice. Attorney J. Ceniceros, Apto. 79, C. Juares, Chih., Mex.

LETTERS Remailed 25c. J. Love, 1419 E. 83rd, Los Angeles 1, California.

SPEED Learning! How to Learn Fast! Save Time, Money! Complete Course Including Speed-Tester $19.95. Satisfaction Guaranteed. Practical Dynamics, Box 170, Washington 4, D. C.

SAVE Your Hair Through Exercise! Instructions $1.00. Bedard, Box 637-E, Detroit, 31.

ARTHRITIS? Home, drugless method. For you! Complete instructions. $2.00. Leo Stuever, 106 Maple, Excelsior Springs, Mo.

MIAMI Remails 25c. Color Scenes, $1.00. Kennedy, Box 532, Miami 38, Florida.

MAIL Received-Forwarded. $3.00 month. Hedgpeth, Box 830, Alhambra 24, Calif.

VITAMINS—Save 45%. Buy Direct. All Formulas. Free Catalogue. Vitaspec, Box 4435-S, Philadelphia 40, Pa.

"BOLOBAM. Defensive quick-knockout street-fighting tricks." Swiftly learned. $2. Gaucho, 846-S6 Sunnyside, Chicago 40.

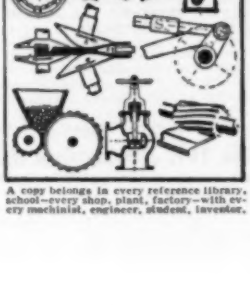
"RULE others with thoughts." (Telepathy.) Details—stamp. Wisdom, 846-S6 Sunnyside, Chicago 40.

Here You Can Find a Solution to Practically ANY MECHANICAL PROBLEM!

PARTIAL CONTENTS:

Accumulators, Air Conditioners, Alarms, Amplifiers, Anchors, Anti-Friction, Baffles, Ball Joints, Bearings, Bed Plates, Blowers, Brakes, Burners, Cams, Chains, Chain Gears, Checks, Chucks, Circular Motions, Clamps, Cleaners, Clutches, Compressed Air Power, Connecting Rods, Conveyors, Coupling, Cotters, Counters, Covers, Cranes, Cranks, Crushing, Cutting, Derricks, Diesel Power, Drilling, Electric Power, Electron Tubes, Elevators, Engines, Expanders, Fasteners, Feeders, Filters, Gauges, Gears, Generators, Governors, Grinders, Grips, Guides, Heating, Humidifiers, Hydraulic Power, Indicators, Infra-Red, Keys, Levers, Loaders, Links, Locks, Lubricators, Magnetism, Measuring speed heat pressure, Mixing, Motors, Nozzles, Parallel Motions, Pawls, Pipes, Pivots, Propulsions, Pumps, Raisings, Refrigeration, Reciprocating Motion, Regulators, Rocket Propulsion, Safety Devices, Sanitation Devices, Scales, Sea Wave Power, Separators, Shafting, Shifting Gears, Shields, Shock Absorbers, Sifting, Signals, Slides, Slings, Sounds, Springs, Startings, Steam Power, Stokers, Swivels, Striking, Sound Receivers, Tappets, Thermostats, Traps, Valves, Vaporizers, Washing, Winding, etc.

A BOOK with OVER 8000 ILLUSTRATIONS WITH DESCRIPTIONS of Mechanical Movements, Devices, Contrivances and Details



A copy belongs in every reference library, school—every shop, plant, factory—with every machinist, engineer, student, inventor.

If you work with machinery of any kind, you may be called upon to devise or improve some job or motion. To do this, you either have to rely on memory, experience or ingenuity. Here in this new book—THE ENGINEERS' THESAURUS by Herbert Herkimer—you will find over 8000 IDEAS and SUGGESTIONS for accomplishing any kind of motion, force or work! It is a compilation of the contrivances, parts, details, tools, machines, devices and means—devised and developed by countless engineers, machinists and inventors over the years—to effect any motion or task. The material has been painstakingly assembled and classified, from many sources—research books, engineering brochures, patent drawings, catalogs, etc. It is, by far, the *largest collection* ever gathered in one book—and the only one which shows, side by side, the many different means and methods for accomplishing any particular task!

Each item, each device, each method is illustrated—there are 8000 such illustrations—and each carries a pertinent description of its makeup and function. THE ENGINEERS' THESAURUS is a monumental work. It is 5½"x8½", 580 pages, printed on coated paper, cloth-bound.

Each one of these "ideas" is practical—just one may save you a lot of "headache"—save on your costs—add to your profits!

Order By Mail

Positive guarantee of money-back-if-not-satisfied.

Price only $5.95

Griffin Publishing Co., Dept. P170
31 West 47th St., New York 17, N.Y.

Send me a copy of THE ENGINEERS' THESAURUS by Herbert Herkimer. If not satisfied, can return book for refund.

- ☐ I enclose $5.95; send book parcel post.
- ☐ Send book c.o.d. for $5.95 plus 42c total delivery charges.
- ☐ Send book and bill us. $5.95 plus 16c postage. (This privilege only to concerns with Dun & Bradstreet rating.)

Name .....

Company .....

Address .....

City ..... Zone ..... State .....

TO TILL WIDER ROWS, JUST ADD EXTRA TINES

Featured on three Mustang tillers, Bolens unique Select-O-Width extension tines let you vary your tilling swath to many convenient row widths. Quick and easy to add—no tools needed. Ideal for the home gardener, Bolens low-cost Junior Mustang is famous for rugged dependability, easy handling. Use it to till, weed, mulch or cultivate.

BOLENS

SEND FOR CATALOG

fmc

BOLENS PRODUCTS DIVISION
Food Machinery & Chemical Corp.
Port Washington 6F, Wisconsin

BIG AUTO NEWS IN SMALL AD

NEW 3 PASS. SPORT CAR COSTS FAR LESS TO BUY TO DRIVE

It's big inside—small outside. Ideal second car or Sportabout. Fully equipped. Written guarantee. Most big car features.

WRITE FOR FREE LITERATURE

Dealers Write For Distrib. Info.

ESHELMAN CO.
Dept. 201, 109 Light St., Balto 2, Md.

GUNS

DERRINGER

START COLLECTING NOW!

- ☐ Derringer
- ☐ German P.38
- ☐ Colt Cobra .38
- ☐ German Luger
- ☐ German Mauser
- ☐ Spanish Moxley
- ☐ Russian Tokarev
- ☐ Japanese Nambu
- ☐ Italian Brevettata
- ☐ Frontier .44 Colt
- ☐ Belgium Automatic
- ☐ Colt .45 Automatic
- ☐ Czechoslovakian Pistol
- ☐ S & W .38 Police Special
- ☐ Iver Johnson Cadet 555
- ☐ Mauser 7.65mm Automatic

$3.95 EACH

POSTPAID FOLDER, 10¢

AUTHENTIC REPLICAS
Reproduced in Actual Size, Design and Balance. Made of Solid Cast Aluminum. Finished in Gun-metal Black.

©1957

• He-man trophies for Rumpus Room, Cabin, Etc. •

Send Cash, Check or M.O. No C.O.D.'s. No Canada Orders. Add 4% Sales Tax in California.

LYTLE NOVELTY CO.
2656-S2 Fashion Avenue, Long Beach 16, California

$1,000,000 IN CONFEDERATE MONEY.

Be a deep-south millionaire with money to burn. You can do everything with this money except spend it. A million bucks in $10's, $20's, $50's, etc. in honest to goodness authentic reproductions of genuine Confederate money plus bonus bills. Light your cigarettes or cigars with a ten-spot. You get a million for $2.98 or four million for $10. Postpaid. Best Values Company, Dept. M-238, 403 Market Street, Newark, N. J.

BOAT KITS

50 Models 8' to 18'

Free Catalog in Full Color

Runabouts, cruisers, convertibles, fishing: $41.75 and up, Freight pd. Luger boats equal factory built; yet save you ⅔ cost. Methods assure a perfect assembly by anyone. FREE color catalog includes: Fiberglas, trailers, paints, hardware, accessories. Write now

LUGER INDUSTRIES, INC.
9200 Access Rd.
Dept. A-2
Minneapolis 20, Minn.

$AVE $ ON U$ GOV'T $URPLU$

Our publication "Government Surplus Sales" lists hundreds of items for sale by the U. S. Government at tremendous savings, as low as 1c on a $1.00.

These are samples of the savings that are being made:

LIFE BOAT	$12.00	GRINDER	$4.69	SHAPER	$15.00	DUMP TRUCK	$76.77
TRACTOR	$75.00	TYPEWRITER	$7.51	FREEZER	$50.00	SPRAY PAINTER	$15.25
				MOTOR	$4.00		

Hundreds others listed in our bulletin "Government Surplus Sales" and may be purchased direct from U. S. Government, Hunting, Fishing, Camping, Sporting Equipment, Photographic Equipment and Supplies, Radio and Electronic Equipment, Amphibious Trucks, Jeeps, Boats, Motors, Binoculars, Plumbing, Electrical Equip., Cars, Power Tools, Machinery, Chemicals, Furniture, Office Equipment, Supplies, Scrap, Etc.

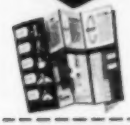
How may you receive our bulletin "Government Surplus Sales?" By sending $1.00 to

GOVERNMENT SURPLUS SALES, P. O. Box 169, Department 4-3, East Hartford 8, Conn.

3 *University* WAYS TO BETTER HI-FI

FREE! Yours for a 2c postcard

3 informative booklets to help you select the high fidelity loudspeaker, enclosure kit, or deluxe speaker system best suited to your taste and purse. Here's a complete range of choice . . . offered by the world's largest custom loudspeaker manufacturer.



P.S.E.—Progressive Speaker Expansion

Most revolutionary development in speaker history. P.S.E. shows you how to start an excellent basic system *now* at low cost, and build up to a superb deluxe system at any time *without discarding original components.*

SPEAKER ENCLOSURE KwiKits

Best for design, construction, ease of assembly , and *performance*. Substantial savings for do-it-yourself fans. Outclass many "factory-assembled" enclosures.

SPEAKER SYSTEMS

Designed to meet every listening requirement, every decor, every budget . . perfectly integrating the most advanced loudspeaker components with precisely crafted decorator cabinets. You haven't *really* heard high fidelity until you've heard *University Speaker Systems.*

Write today, listing booklets desired.

UNIVERSITY LOUDSPEAKERS, INC.
Desk B-3, 90 So. Kensico Ave., White Plains, N.Y.

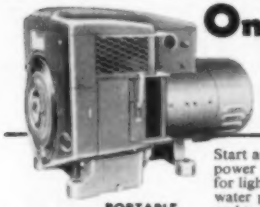
LISTEN *University sounds better*

FISHERMEN
Make your own SINKERS JIGS SQUIDS CASTING and SPINNING LURES

It's fun, it's easy with Sweet's
ALUMINUM MOLDS
Molds for fresh and salt water fishermen. Handled and hinged for easy, fast operation. Over 100 types, 500 sizes. Write for FREE catalogue TODAY.

AS LOW AS **2.95** per mold

SWEET'S MOLDS
TONAWANDA 31, N. Y.



Onan *Emergency*
Electric Plants

Start automatically when highline power is cut off, supply current for lights, heating system, freezer, water pump, stove, all appliances and machines. Prevents losses and hardships. Plant stops automatically when power is restored. Compact, easy to install. 500 to 75,000 watts A.C. Priced from $319.00.

PORTABLE MODELS
500 to 10,000 watts. Supply plug-in power anywhere!

Write for Free Folder

D. W. ONAN & SONS INC.
3596A UNIVERSITY AVE. S. E. • MINNEAPOLIS 14, MINN.

1000 AND 1 USES!

Pliobond by **GOODYEAR**

Super-glues "anything to anything" — super-quick!
At chain, hardware and hobby stores everywhere.
Pliobond—T.M. The Goodyear Tire & Rubber Company, Akron, Ohio

ENJOY
your boating . . . starting now!

Free!
1958 Starcraft Catalog

Now's the time to pick out your Starcraft Boat. Twenty-four pages in color showing sixteen new aluminum and fiberglas models. Get your copy now. Write:

STARCRAFT BOATS
Dept. N-2, Goshen, Indiana

'58 CHRIS-CRAFT BOAT KITS

Save big money! Easy to assemble!

14' Barracuda, kit $268. Other models, $61 to $1156

- As low as $61!
- Save ½ or more!
- 20 models — 8' Pram to 22' Cruiser
- Over 100,000 in use!
- FREE CATALOG

Chris-Craft Boat Kits are packed with advanced-design features that spell BIG VALUE: Flite-Speed styling, wrap-around windshields, fiber-glass cabin roofs. Highest quality pre-cut, machined or pre-assembled parts and simple directions make assembly quick, easy—and fun! See dealer or write for brochure. Distributors, dealers: valuable franchises available.

Prices subject to change.

CHRIS-CRAFT CORPORATION
Boat Kit Division • Pompano Beach, Fla.

MANUFACTURE THIS BEAUTIFUL CONCRETE OUTDOOR FIREPLACE

Right In Your Own Backyard

$4.00 Worth of Sand & Cement produces this Attractive Fireplace.

Sells on Sight from $60. to $80. Easy to start your own Profitable Business.

The General Fireplace Molds and Process are the most amazing and foolproof ever invented. Simple to operate. Two men can produce five fireplaces a day.

BIG DEMAND!!

Sell all you produce to Department Stores, Homeowners, Parks, Nurseries and Picnic Groves. Fireplaces sell on sight. No experience necessary. We supply full operating instructions and equipment plus the know-how that spells BIG PROFITS. This is an outstanding opportunity for men of vision and small capital to get into a busy rich paying field. Don't delay, be the only exclusive manufacturer in your own home town. Mail coupon at once for full details as to how you can reserve your territory. **Molds sold only on exclusive franchise.**

GENERAL ENGINES CO., Inc., Dept. SF-28
ROUTE 130, THOROFARE, NEW JERSEY

Mr. Tor of Philadelphia writes: Sold 250 in first 4 months. Selling to Sears Roebuck, John Wanamaker, and Gimbel Bros. in Philadelphia area.

Name .....
Address .....
City ..... Zone .....
State .....

NEW MIDGET SHORT WAVE RADIO

GETS STATIONS 12000 MILES AWAY!

Tunes ALL foreign short wave bands, London, Paris, Moscow, Australia. ALL Amateur bands 160 to 10 meters! ALL long distance Air Force and Air Line aircraft, Ships at Sea, AP overseas broadcasts, State-County Police, Industrial bands—U.S. Radio broadcasts. Tunes 500 KC to 40 mc.—600 to 7 meters! NOTHING LIKE IT ON THE MARKET ANYWHERE AT ANY PRICE. Super-regenerative Receiver. Short antennas included—Hook up in 1 second! PORTABLE SELF-CONTAINED— POWERED WITH RADIO BATTERIES SOLD EVERYWHERE. NO AC PLUG-INS! Size only 4½" x 6" x 4". Wt. complete-3 lbs. Calibrated hi-ratio easy tuning dial. Wonderful for Boy Scouts, tourists, vacations, amateurs, short wave listeners. EVERYONE CAN NOW HEAR THE WHOLE WORLD TALKING!

SEND ONLY $4.00 (bill, ck, mo) and pay postman $12.95 COD postage on arrival or send $16.95 for postpaid delivery. Complete easy to wire kit includes all parts, tubes, broadcast coil, plastoid cabinet, instructions—(set of long life batteries $2.99 extra). COMPLETELY WIRED AND TESTED—POSTPAID IN USA $21.95. Easily a $49.95 value. Order now before price goes up—GUARANTEED—AVAILABLE ONLY FROM:

WESTERN RADIO Dept. BRS-2 KEARNEY, NEBR.

ANOTHER OF INDUSTRY'S

MOST-WANTED MEN

Radio-TV Technician—many excellent positions open in manufacturing and service. I.C.S. training can help you qualify within a few short months.

SEE SPECIAL OPPORTUNITY CHECK-LIST—PAGE 51

DINSMORE *Compasses*

Beautiful, precision made. Designed and styled for modern cars. Dinsmore compasses save you time and money by showing you the right way—the short cuts. An ideal gift for every one who drives

ONLY COMPASS APPROVED BY AUTO MAKERS!

WRITE FOR COMPASS HISTORY FOLDER

TRAVELITE $5.95 — GUIDEWAY $4.95 — SEE YOUR DEALER

DINSMORE INSTRUMENT CO., 1814-27 Kelso St. FLINT 3, MICH.

FREE GERMAN STEEL HUNTING KNIFE

4-INCH BLADE

We give you hardest hunting and fishing knife you've ever had! Has 4-INCH LONG highly tempered steel blade—VERY SHARP! Attractive handle. We send knife FREE to acquaint you with our below-wholesale bargains. Please send 25c for handling NO LIMIT—but send 25c handling for each knife. Order TODAY!

HUNTING KNIFE, Dept. K-297, Box 881, St. Louis, Mo.

DRIVE BY TACHOMETER!

Get Sports Car Snap, Economy!

For peak performance, with better gas, oil mileage and longer engine life, tune and drive your car by tachometer, like professional test and race drivers! Electro-Tach, compact, self-contained precision electric tach, gives top tuning and operating control at a glance. Gives "feel" of engine in any car. Quick, easy to install. 3 models. Top values. Write for literature today!

DIXSON PRODUCTS CO., Dept. A2, Vashon, Wash.

FOR BETTER WATER SKIING

Fit your outboard motor with the MICHIGAN PROPELLER designed to give you greater thrust, quicker pull-ups, more skiing buoyancy. Send postcard for your FREE copy of our new 1958 OUTBOARD CATALOG. NOW! It contains propeller recommendations carefully engineered to provide better performance for every specific motor-boat-load combination—whether for skiing, speed, cruising or all around operation; also, fine line of skis, boat accessories.

MICHIGAN WHEEL COMPANY • Dept. PS-2
Grand Rapids 3 • Michigan

ATOMOTRON

First Model Atom Smasher!

NOW $9.95 up

See and learn the wonders of Nuclear Physics and Electricity with miniature high-voltage generator. Make artificial lightning . . . pith balls defy gravity, propellers turn at a distance. Only 6" high. Produces 75,000 volts on a 2-inch diameter sphere, yet is absolutely safe for the youngest child. Illustrated operation manual included.

COMPLETE WITH FOLLOWING APPARATUS

- *Smog Control Unit*
- *Field Reaction Rotor*
- *Plastic-encased Pith Ball*
- *Paper Strand Cluster*
- *Electric Wind Unit*
- *Neon Light Wand*

Atomotron, battery operated, runs for hours on 2 flashlight cells. Ship. wt. 1 lb. ..... $ 9.95
Atomotron operated by sturdy 110-volt motor, accepted by UL. Ship. wt. 4 lbs. 19.95
Atomotron, kit form, AC motor, needs only screwdriver to assemble. Ship. wt. 3 lbs. 14.95
Cash, check or M.O. Plus P.P. costs. (In Calif. add 4% sales tax)

A ∞ L ATOMIC LABORATORIES
3086 CLAREMONT BERKELEY 5, CALIFORNIA

TREMENDOUS Profits with Hagen's Exclusive TEAR GAS PENCIL!

This Tear-Gas Pencil discharges smothering clouds of tear gas to instantly stop, stun and incapacitate the most vicious man or beast, an effective substitute for dangerous firearms; leaves no permanent injury. No selling experience needed. Handle as a profitable sideline . . . soon you'll sell it full time. Start now! Send $5.95 for complete demonstrating kit of Automatic Tear Gas Pencil, 10 demonstrators & 3 Powerful Tear Gas Cartridges. Not sold to minors.

SELLS EASY TO SERVICE STATIONS SMALL STORES LOAN OFFICES BANKS, HOMES

HAGEN SUPPLY CORP., Dept. P-28, St. Paul 4, Minn.

GEARS

In Stock—Immediate Delivery

Gears, speed reducers, sprockets, thrust bearings, flexible couplings, pulleys, etc. A complete line is carried in our Chicago stock. Can also quote on special gears of any kind. Send us your blueprints and inquiries.

Send for Complete Catalog No. 220

CHICAGO GEAR WORKS
440-450 N. Oakley Blvd. Chicago 12, Ill.

Gypsy Bait Oil MAKES FISH BITE OR NO COST

Mysterious aroma of Gypsy Fish Bait Oil Compound makes smell feeding fish wild through thousands of smell organs covering their bodies. One potent drop on artificial or live bait draws in fresh or salt water whether you still fish with pole, cast, spin or troll. Really works. Only $1.98 (3 for $4.98). Cash orders postpaid. If C.O.D. postage extra. Draws fish to your bait or money back. FREE. Handy large water resistant pouch with every bottle. Order from:

WALLING KEITH CHEMICALS, Inc.
Dept. 501-B Birmingham 1, Alabama

LOOK WHO

is using the new

Johnson "citation"

Tom Gallery, Director of Sports, National Broadcasting Company uses and advocates the CITATION.*

VIP's, Very Important People from all walks of life, find lots in common when they select a spinning reel for light salt water and heavy fresh water fishing. These particular fishermen, some who can afford to pay a lot more* and some who have to carefully budget themselves*, all use the Johnson CITATION.

**To us, all are Very Important People.*

The Johnson CITATION comes loaded with 125 yards 10# test mono-filament line and has a 24" retrieve. Can be used on spinning or casting rod, right or left hand retrieve, and has all the other features of the famous Johnson Century Reel. Your favorite dealer will be glad to show it to you.

THE DENISON-JOHNSON CORP.
Mankato 64B, Minnesota

ARBO-GASTERS PAY OFF BIG AT LAS VEGAS

Abe Schiller, executive vice president of The Flamingo Hotel, Las Vegas, Nevada, writes: "Our cruiser always carries a full set of Arbo-gasters to insure our guests success with the big lunkers of Lake Mead." Arbo-gaster dives like a jet, runs right over stumps and rocks. Easy to control running depth. Perfect for trolling, won't twist line. NEW 1/8-oz. size, also 1/4-oz. and 5/8-oz.—all $1.35 each. 15 Colors.

FLOATS • DIVES DEEP • RUNS DEEP

For Spinning
For Spin-Casting
For Bait-Casting

MAIL FOR BIG FREE CATALOG

Fred Arbogast CO., INC.
2322 W. North St., Akron 3, Ohio

Please send my FREE copy of latest Arbogast color catalog of baits—full of pictures of catches.

Name _____

Address _____

City _____ State _____

"OLD IRONSIDES" MODEL KIT!

Historic U.S. Frigate. Every detail accurate—armaments, spars, longboats with oars. Precision plastic parts, cement, plans. 16¾". For catalog write Dept SF, 4223 Glencoe, Venice, Calif.

wherever hobby kits are sold Revell

$2.98

Don't Miss it!!!

CORCORAN'S
NEW
Fishing • Camping Hunting Catalog

Send now for your FREE copy of Corcoran's 1958 Spring-Summer Catalog. It's just out and it's filled with hundreds of fully illustrated, practical, field-tested specialties for the sportsman . . . boots, tackle, tents, boats and other items.

CORCORAN, INC.
Box PS-28, Stoughton, Mass.

AMMUNITION

for a fraction of regular cost

Reload a whole carton for the cost of a few rounds of factory ammunition. New 200-page Lyman Reloading Hand Book shows you how, safely and easily. Ten big sections loaded with data and pictures show you how to have more fun with rifles, pistols, and shotguns. $2.00 at your dealer, or sent direct postpaid.

THE LYMAN GUN SIGHT CORP.
MIDDLEFIELD • CONN.

NEW!

LAYTRAC RIDING CRAWLER OUTWORKS ANY TRACTOR ITS SIZE

LOWEST COST FOR 9.2 H.P.!

Laytrac works where others bog down! No slipping, drifting, tipping on slopes. Ideal for dozing, plowing, field work. Rugged, easy to operate. Big tractor quality! Borg-Warner 3-speed and reverse trans., cone clutch steering, 925 lbs., including blade, floating drawbar, PTO. Guaranteed. Accessories available. At dealers or direct. Write for literature.

Tractor less blade, pp. anywhere in U.S. (Includes PTO and floating drawbar. Blade $65.) $895

LAYTRAC
2548-C2 Airport Way, Seattle, Wash.

GERMAN AUTOMATIC 6-SHOT REPEATER —22 CAL.

• Blank Cartridges • Latest Model
• No Permit Required • Fully Automatic

Self ejecting clip. Firing spring adjustable. Precision made by the Finest West German Gunsmiths—Wonderful for sporting events, theatrical performances, to scare would-be attackers, etc. 4" long, perfectly balanced. Sold on a money back guarantee—Send $6.69 Cash, check or Money order for

$6.69 Postpaid

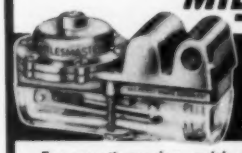
BEST VALUES COMPANY
Dept. G-48, 403 Market St., Newark, N.J.

JEEP OWNERS

RE-POWER NOW with a V-8 engine—Use
FORD • CHEVROLET • MERCURY
in 2 or 4 Whl-Dr. Jeeps, Jeepsters, Sta-Wgn. Trucks, H.J. and Kaiser cars. Conversion Kits $43.25 to $59.85. If you want fast action tell us which engine you wish to use, give us year, Model, (2 or 4 Whl-Dr), of your vehicle. Send Min. $15.00 Dep. and we will ship correct kit, Bal. COD. Send full amt. for Prepaid shipment. Wire, phone or write for free details. (Also kits for Ford 6 engine.)

HOOSIER MACHINE PRODUCTS CO.
314 S.E. 6th St. Phone CRG-3442 Pendleton, Oregon

ENGINES "Sing"! WITH MILESMASTER®



FUEL PRESSURE REGULATOR

For smooth running, quick starting, better mileage . . . install a genuine MILESMASTER. Prevents flooding. Only $6.95

MILESMASTER, INC., Dept. J, Exeland, Wisconsin

NEWEST

ALUMA Craft

CATALOG NOW READY

● Send for this complete presentation of the newest in boats, runabouts and canoes. Shows 26 models, including 2 new Aluma Glass runabouts, in full color exactly as you would see them at the big boat shows. See new styles, new ideas, new sizes with a range of prices to fit every pocketbook. Now ready. Write for your free copy.

Our design and construction have set many new boating industry standards for style, performance, safety and strength. Aluma Craft require practically no upkeep. Write for catalog.

ALUMA CRAFT BOAT COMPANY • 1521 Central Ave. N.E., Minneapolis 13, Minn.

THIS FIREPLACE... warms every corner

Build your fireplace around a Heatilator Fireplace unit for extra comfort *plus* smoke-free operation. The Heatilator unit takes cool air into the heating chamber at floor level, warms it, circulates it around the room . . . no hot spots or chilly corners. The exclusive Pressure-Seal Damper prevents loss of winter warmth and summer air conditioning when fireplace is not in use. Ideal for basement rooms, cabins and summer homes. Sold by leading building materials dealers.

WRITE! FOR FREE CATALOG!
Heatilator Div.—Vega Industries, Inc.
862 East Brighton Ave., Syracuse 5, N.Y.

HEATILATOR FIREPLACE
famous for over 30 years

Taylor ★ **tops 'em all**

with this new HOLIDAY CONVERTIBLE

When you buy a windshield, be sure it's the Taylor-Made Holiday — then you can add the Top later.

New glamour-styled VENTILATED Convertible for all-weather cruising comfort. Bold, panoramic Windshield features new Speed-Aire Wing Ventilators for complete air-draft control. Top now available in White Vinyl Nylon! Complete range of stock sizes for a perfect fit on almost every open boat. Taylor-Made — by the leader in Windshields and Convertibles.

MAIL COUPON FOR FREE 1958 FULL COLOR CATALOG

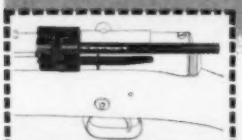
N. A. TAYLOR CO., INC., Gloversville, N.Y. Dept. PS-258
Please send free catalog of Taylor-Made Products.
Name.....
Address.....

NEW! THE MOST REVOLUTIONARY ADVANCE IN PELLET GUN SHOOTING IN A DECADE!

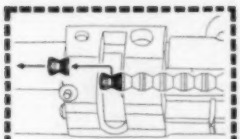
Crosman

.22 CALIBER PELLGUN RIFLE

"400" REPEATER



AMERICA'S FIRST PERFECTED PELLET FEEDING AND LOADING ACTION



NO JAMMING! NO SPILLING! FEEDS IN ANY POSITION!

featuring

Exclusive Patented SWING-FEED® LOADING with Load Indicator, and TRU-FLYTE® BARREL

Another first by Crosman—a Repeater Rifle! No more manual loading. Crosman SWING-FEED LOADING feeds and loads ten pells automatically as you slide the bolt! Crosman Load Indicator pops out to show when chamber is loaded. Absolutely trouble-free. TRU-FLYTE Barrel delivers amazing new accuracy in pellet shooting. WRITE for colorful, new shooting booklet, Crosman Arms Co., Dept. PS-14, Fairport, New York.

NOW STOCKED BY CROSMAN SELECT DEALERS

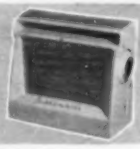
Shooting Is 3 Times MORE FUN with Crosman

Power Without Powder® **PELLGUNS**®

Available in Canada

World's Largest Manufacturer of Pellet Rifles and Pistols

The 6-Transistor Portable That Plays Anywhere!



build your own HEATHKIT *radio and* **SAVE**

HEATHKIT TRANSISTOR PORTABLE RADIO KIT

MODEL XR-1 **$34.95**

(with cabinet, less batteries)

No other portable gives you so many important features at such a low price. You get a 4" x 6" speaker for "big-set" tone—500 to 1000 hour battery life—unbreakable molded plastic cabinet in Holiday Gray—efficient, all-transistor circuit—and easy, step-by-step assembly instructions and pictorial diagrams. Have fun building and using this fine set. Shpg. Wt. 4 lbs.

FREE HEATHKIT CATALOG AVAILABLE

Pioneer in "do-it-yourself" electronics

Describes many more "do-it-yourself" kits for hobby—hi-fi—ham radio—and experimenting. Get your copy now for complete selection of fun projects that save you money.

HEATH COMPANY

BENTON HARBOR 16, MICHIGAN — A SUBSIDIARY OF DAYSTROM, INC.

Please send FREE Heathkit Catalog

NAME _____

ADDRESS _____

CITY & STATE _____

NEVER AT THIS LOW PRICE!

GENUINE 135-POWER ACHROMATIC TELESCOPE

with Achromatic Lens and 4-POWER FINDER attached

ONLY $18.95 PREPAID

EXTRA BONUS GIFTS:
- 273 page book, "Handbook of the Heavens"
- Magic Star Finder Dial
- 220X & 400X Eyepiece lenses

5 Magnifications 18X—35X—65X—85X—135X

Brings the Moon, Planets, Stars, Satellites, People 135 times Closer, Clearer, Sharper

Never before has an ACHROMATIC 135X telescope with range finder and tripod sold for anywhere near this amazing low price! Now you can not only explore the heavens and bring the moon, planets, stars, satellites 135 times closer, but you can observe all distant objects, people, ships too, because all pictures are erect, not upside down as in all astronomical telescopes. The kind of needle-sharp color-free viewing only a genuine achromatic lens can bring you. Ready for immediate use. 5 precision lenses bring you viewing at 18X—35X—65X 85.X—135X. Tubes extend to 43" made of bakelite, finished in camera bellows black, trimmed with gleaming brass. 4 power finder scope (30mm Lens) mounted on main tube is feature actually found on more expensive telescopes—brings difficult objects on target before observing with main scope. For extra stability 5 ft. hardwood folding tripod is equipped with heavy cast iron head fitted with Criterion's famous 360 degree all aluminum mount that locks instantly in any position. Obtainable only from Criterion Co. shipped prepaid. 4 famous gifts—273 page book "Handbook of the Heavens." Magic star finder dial that aids in locating stars ANYWHERE at ANYTIME of the year. 220X & 400X eyepiece lenses included free for experiments. You must be completely satisfied with this super offer or your money back in full. Shipped Complete, nothing else to buy at amazingly low price of **$18.95.** Without tripod **$14.95.**

Send Cash, Check, or Money Order today

Dept. PST-24, CRITERION CO., 331 Church St., Hartford, Conn.

Get your choice in the smart, new uniform of choice — MODERN ARMY GREEN

"CHOOSE YOUR TRAINING—I DID!

"I found only the Army guarantees high school graduates their exact job training. There's a course for every need, and it's reserved for you before you enlist, so you're sure to get the training you want. I picked Diesel Mechanics. It was a great course that I could never have afforded otherwise. Your Army Recruiter can show you how to get the training *you* want, too."

Victor R. Jones

• Pvt. Victor R. Jones, Miller, Ohio.

"CHOOSE YOUR TRAVEL—I DID!

"I wanted to see Europe, and I found only the Army lets you choose your own foreign travel. I picked my exact overseas assignment, and it was even guaranteed before I enlisted. What's more, I enlisted with my brother and we'll stay together all the time we're overseas. You and your buddies can plan your foreign travel just like I did. Your Army Recruiter can show you how."

Charles R. Carrico

• Pvt. Charles R. Carrico, Springfield, Ky.

"CHOOSE YOUR BRANCH—I DID!

"I'm serving the way I wanted to, because I found the Army would let me pick the branch that interested me most. I chose Anti-Aircraft, and I'm getting top leadership training in electronics and guided missiles—a really important field of the future. You can pick the Army branch you like the best, too. Just name it and it's yours—guaranteed before you enlist."

John D. Finley

• Pvt. John D. Finley, Colebrook, N. H

Only in MODERN ARMY GREEN can you choose your JOB TRAINING • TRAVEL • BRANCH

For details on how to choose before enlistment, send for your free booklets today. Or for immediate counseling visit your local Army Recruiter. He's listed in the phone book and will give you all the facts—at no obligation!

THE ADJUTANT GENERAL PS-2-58
Department of the Army
Washington 25, D.C.
Attn: AGSN

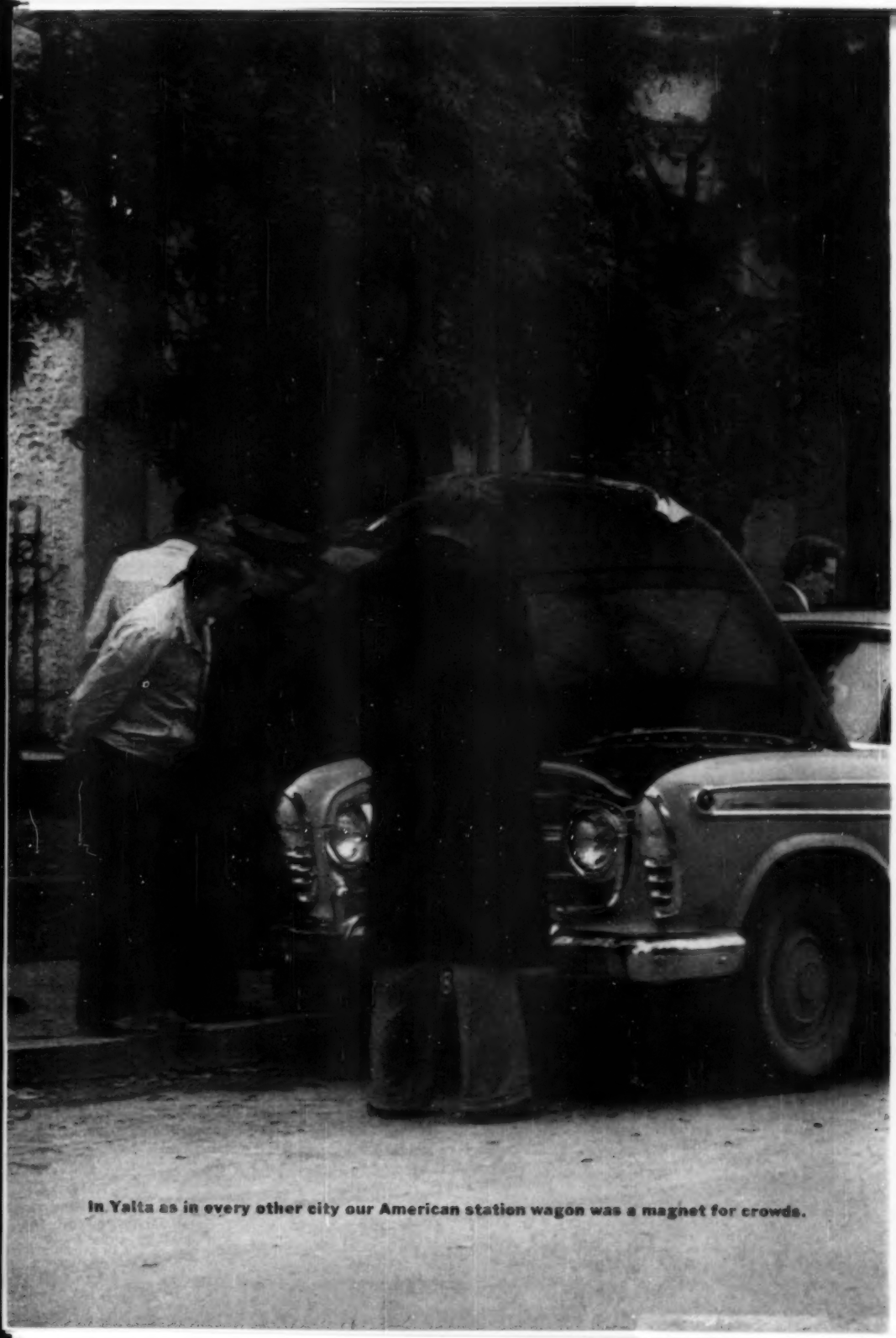
Please send me the free Army booklets describing special opportunities that only come with Modern Army Green.

Name_____

Address_____

City_____ State_____

Date of Graduation_____



In Yalta as in every other city our American station wagon was a magnet for crowds.

POPULAR SCIENCE
REG. U. S. PAT. OFF. Monthly

A POPULAR SCIENCE editor's uncensored report:

Inside Russia by Car

By Harry Walton

NOT another car was in sight as I pulled up at the loneliest border post I had ever seen. This was the beginning of an adventure into another world.

As the first American journalist to drive a U. S. car through the interior of the Soviet Union, my route would take me east to Moscow and south to the Black Sea—to such little-known cities as Kursk, Kharkov, Zaporozhe. Beyond, down the empty road that lay ahead, I was to find a strange and

"Ahead lay Soviet Russia, a strange and contradictory land . . . viewed through the

contradictory land—one of broad highways and tiny hamlets, of grim national police and obsequious service, of women laborers and pretentious hotels.

Traveling with me was Dennis Michael O'Connor, a graduate fellow at the Yale Law School, who had a working knowledge of the Russian language. Our car was a 1957 Rambler station wagon.

Cold, wind-driven rain fell from a gray sky as we rolled onto the iron-railed bridge that spans the Bug River between Poland and the USSR. Even before we reached the Russian side, a rifle-carrying young Soviet soldier stopped us with a stiff military gesture. I tried speaking German to him. He shook his head. I offered him a cigarette. He refused it.

A sudden gust of wind blew my hat off, and instinctively I started after it. But I was not to enter the Union of Soviet Socialist Republics so informally. "Nyet!" barked the guard, and sprinted after the hat himself.

Shortly afterward a Pobeda rolled up, stopped smartly. A hawk-faced young Russian officer got out and checked passports. We were told to follow—and drove in the Pobeda's tracks to the Russian city of Brest-Litovsk.

At the railroad station, the car was immediately a focus for curious eyes. We followed an officer into a huge marble-walled waiting room. Through the windows we caught glimpses of handsome, bright-green railroad cars, occasionally heard the treble piping of a Russian locomotive.

In a high-ceilinged room upstairs we met our guide and interpreter, Valentine Salin, a soft-spoken, slight man with impeccable manners. Our new Rambler was due for an oil change, so we asked about a service station. We were led by the Pobeda through an iron gateway into a huge concrete yard. Promptly every Russian in the place came up to the car, and the questions began.

Nyet, not Angliski. Aftomobile Americanski. Nyet, not Ford or Chevrolet. Marka Rr—rr-rambler (the Russians roll that first "r" with the best of them). *Belgian plates because assembled in Belgium. Yes, new 1,951 kilometers ago.*

Eyeing the drain pit with alarm—it was a deep gash in the concrete floor, with hardly two inches of guard rail—I drove over it under the stare of 40 Slavic eyes.

While O'Connor held forth to a fascinated audience around the opened hood, I clambered down into the pit myself. My notion was to make sure the mechanic drained the engine, not the transmission, and kept the copper gasket on the drain plug. I needn't have bothered; he did.

"Aren't you going to start the engine before putting in new oil?" a Russian asked O'Connor. "It works better." O'Connor told him *we* didn't do it that way. There was a little flurry, as air was being added to the tires, when the hose fitting parted. Embarrassed at this technological lapse, three mechanics scrambled around to join it, finally in desperation held it together by hand.

windshield of a U. S. car"

With goodbyes all around, we set formally off beyond the Iron Curtain. In the back seat was Salin—our guide, interpreter and (perhaps) private eye. I had an eerie what-am-*I*-doing-here? feeling.

My assignment was to drive 3,500 miles through Russia and report on how it differed from, say, a transcontinental U.S. trip. I started out with standard preconceptions: The roads would be terrible, the natives hostile, and I'd be in real trouble if anything broke on the wagon that couldn't be fixed by a tractor mechanic.

The preconceptions were wrong. The Russians I met were not hostile, and the roads and mechanics were first-rate. In several cities I met friendly, curious, wide-awake students, (including some who regularly read POPULAR SCIENCE in the technical library). Often I talked with earnest, unsmiling but not unfriendly adults who took to heart their government's much-repeated slogan: "Beat America." Everywhere I saw evidences of a dedicated national effort to cram into two decades the industrial revolution that has taken the West two centuries.

There is no speed limit in the USSR except through villages. The road east to Moscow is superb, more than wide enough for four cars abreast, with a well-maintained asphalt surface. Yet pedestrians, wagons and livestock made it imperative to reduce speed when dusk fell. In a land where the trucks rarely have working tail lights, you cannot expect them on cows. It is strange, too, that the country that first launched Sputniks hasn't given its bicyclists the humble but effective reflector button.

Tourists are privileged characters. In Minsk, we overlooked a no-passing sign and ran around a couple of trucks. Instantly an outraged militiaman (national police officer) thrust his baton downward in a gesture that would mean "pull over" in any language, and whistled us down, anger in every trill. We waited apprehensively as he stalked over. Our guide said a few words. The militiaman saluted and walked away. "You see?" Salin said imperturbably. "He apologized."

You can turn right on red in Minsk but are not supposed to blow a horn. It is wise to beware of the red circle that means no entry, or else you may find yourself driving down a flight of stairs. Most traffic signs, fortunately, are pictorial ones, easy for foreigners to get.

We stayed that night in a grandiose hotel with an elevator about four feet square. Inward-opening doors on the car made things comically awkward at times —two passengers with luggage become a crowd. Control is by pushbutton, with an operator to do the pushing—and you either learn the Russian for figures up to five, or resort to the childish alternative of holding up fingers.

Rooms are big, high-ceilinged, with enormous double-sash windows and often a balcony. Sometimes the beds stand in a curtained alcove. Rugs and drapes abound but lack the cool smartness of those in Western hotels. Bathrooms are crude affairs with asthmatic plumbing and primitive fittings. The huge bathtub and generous towels are often negated by a lack of hot water. You can use an electric shaver if you have an adapter for the round-pronged receptacles. The juice is 50-cycle A.C. at 127 volts—on which U. S. shavers are willing to function.

Formal sightseeing was encouraged always. In Minsk, we stopped at the Park Kultury (Park of Culture) to see something called the Children's Railroad. The name is misleading, for it is a very respectable narrow-gauge line with several kilometers of track, signals, a dispatcher's office, real cars and man-sized steam locomotives. But it is operated by six-to-14-year-olds, who have to qualify for the privilege. There is class instruction, too, to be sure that the youngsters absorb information with their fun.

Good as the highways are in this part of Russia, they're no expressways. Herds

Text continued on page 100 . . . Exclusive photos on next six pages

Rolling country in the Crimea on the way to Yalta. Trucks are the workhorses of Russian

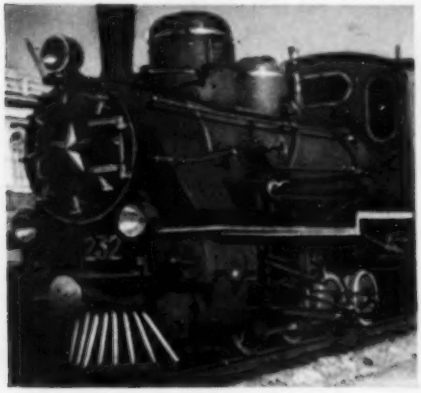
CO-EDS DIG A DITCH in the main street of Simferopol on their day of free labor for the state. Prettier than most women workers we saw, they made a lark of it. Russian women work hard, not only as breadwinners but in daily food shopping that may take two hours or more.

highways. The kilometer post (in center, above) and guard posts are standard on main roads.

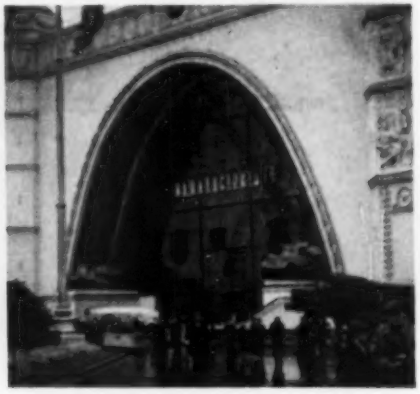
BALKY BOVINES BAR THE ROAD. But patience gets you through, sometimes with the help of the herder. Question: If a state-owned truck kills a state-owned cow, who sues whom? Or does the driver pay? Other roadblocks are slow wagons, unhurried flocks of geese and ducks.

COLORFUL ROADSIDE MAP in New Zaporozhe pictures production goals in the Ukraine under the sixth five-year plan. Goods-hungry Soviet citizens feel they have a stake in statistics.

ENGINE OF CHILDREN'S RAILROAD in Minsk is no toy, but a 30-inch-gauge coal-burning steam locomotive. The kids' line at Kharkov is junking its oldest engine in favor of a new diesel.



IMPRESSIVE ENTRANCE to Industrial Exhibit is matched by displays of giant machine tools, tractors, trucks, cars and motorbikes inside. But waiting lists for new cars are years long.



SEWER FOR SIMFEROPOL. A dragline shovel helps excavate for pipe. Co-eds digging elsewhere on this street asked why we didn't "shoot" the machine instead of them. So we did; here it is.

MOSCOW CROSSWALK. Traffic, squeezed right by posts that protect woman painting STOP on the pavement, waits for light at Gorki Street. Area at lower right is mid-street safety strip.

SUNLIGHT ON THE KREMLIN, and shadow on a Moscow street. Autos may be few, but walks are always crowded.

MAIN POST OFFICE in Moscow announces International Letter Week, urges Ivan to write his friends and relatives.

RED SQUARE with St. Basil's (left) and one of five starred Kremlin towers. Folks cue up for Stalin-Lenin tomb (right).

School kids at Yalta look over our

wagon, while one worried small boy and a curious blonde girl inspect the photographer.

A soldier eyes the aftomobile Americanski. In this crowd at Kharkov, there's a station wagon

of plodding cows with no intention of yielding the right of way, trains of geese in stately single file, and both bikes and pedestrians wandering about unpredictably require a sharp eye on the road.

Then there are the flax threshers. I don't know what it's like to hit a foot-high layer of flax stalks at speed, because by luck we always slowed down in time. The women who sat by the road would wave us on over the stuff. After enough wheels have crunched it, the women pick the stalks out and make piles of the seed, which stays right there on the road until a truck comes along to pick it up. You aren't supposed to run over the seed—or hit the platform scale on the highway.

Road repairs are equally casual. Sometimes we encountered—hidden around curves, with neither sign nor flagmen to give warning—braking crises in the form of machines, gravel piles and work crews. The crews are predominantly female. Men drive tractors, dozers and rollers; the pick-and-shovel jobs are women's work. We even saw a railroad section gang of women. "Here," our guide explained, "they have equality."

Most motor traffic consists of olive-drab trucks with license numbers stenciled high on the tailgate. Some roll at 50 m.p.h., but many are slower. At crossroads, a driver who pulls to the middle of the road may (1) intend to swing wide into a right turn, (2) mean to turn left, or (3) simply like lots of room.

Russian drivers, of cars as well as trucks, are conscientious, actually, about signaling left turns on the highway. This they do by opening the left-hand door wide. Some even stick their heads out.

Our guide was apprehensive about overtaking trucks without warning. "Honk him! Honk him!" he would say tensely. Since outside mirrors apparently haven't yet been invented in the Soviet Union, this was good advice.

About overtaking America: There is no brand-name advertising on Russian roads—but there *are* billboards. The big posters and signs admonish the passerby to "Overtake America" or to "Work for World Peace." Others are exhortations to work harder, produce more, stop having accidents.

Directional road signs are big, clear and plentiful. Many include destination arrows that warn of turn-offs and show where they lead. Occasionally there is a big signboard strip map along the road (free gas-station maps are unheard of). Every kilometer along the main Russian highways is marked by a neat post with two mileage plates on it. One side shows the distance from Moscow, the other the distance from the provincial city at the far end. Concrete guard posts, drainage ditches, guard rails and warning signs are substantial and well kept.

Shy tourists should stay home, for any foreigner in the USSR is conspicuous, and one in a foreign car triply so. Our station wagon galvanized Russians into attention everywhere. Women stooping at work in the fields would straighten up to stare. School children plodding home at dusk from double sessions cried out in amazement. Whenever we pulled up on the road, people appeared from nowhere.

They all wanted to know the same things: what make the car was, how many cylinders the engine had, its horse-

(note open hood). At right, O'Connor reads children's names written in dust on the Rambler.

power, and the gas mileage we got. Heavily loaded and cruising at 60 m.p.h., we were getting 9½ kilometers to the liter, a figure that greatly impressed our hearers. (Ours was obviously a bigger car than their Pobeda, which takes more gas.)

The price of the car, which Russians asked shamelessly and we told them gladly, impressed them as a great bargain. The Russian Volga, a much smaller car, costs 30,000 rubles—a whopping $7,500 at the official non-tourist rate of exchange, or three times the average worker's annual pay. Our Rambler delivered in Belgium at $2,600.

Between Smolensk and Moscow, traffic thickened, and I was surprised by the number of prewar American cars in sight—until a closer look revealed the ZIS or ZIM on the hubcaps. (The ZIM is a copy of an old Buick, the ZIS of a Packard.)

In rush hours, Moscow traffic flows at quite an alarming pace on the city's broad boulevards (I clocked taxis at 55 m.p.h.). Driving is a battle of wits between motorists and pedestrians, who pay no heed to lights. Since horns are prohibited, a driver's chief weapon is outbluffing the crowds. He who hesitates behind the wheel is lost—in a maelstrom of foot traffic.

Drivers are far more rigidly controlled than pedestrians. On many major intersections you can't turn left (an arrow pointing straight up means no turn at all; if it has a branch, you can go straight, or turn as indicated only). Where no left is permitted, you turn right and then make a U-turn in a designated gap through the midstreet safety zone. This works fine.

A sign with a red bull's-eye and an arrow pointing right means you wait to turn right on red. Some intersections have a row of four instead of three lenses in their traffic lights. The idea (and you'd better get it) is to wait for *two* greens to turn left.

It was time for a car wash when we reached Moscow. At the garage, two earnest, motherly little women in rubber boots and aprons took the Rambler in hand with spray hose and washcloths. Far too short to reach over the top, they flung the cloths up onto it and drew them down. When they were finished the car sparkled inside and out.

Russian mechanics, interested and helpful, made a new gasket for our leaky

SKOLKA? How many? The better, 74-octane gas was available only at a few special pumps.

jerry-can spout. But when I asked for an antifreeze hydrometer, they could only shrug their shoulders—and taste the stuff in the radiator instead. Savoring the coolant, they said it hadn't much antifreeze.

Every truck in the USSR seemed on its way south when we took off on the long haul for Yalta. To cover the long distances we drove after dark. Rolling country made night driving tricky; just over the crest of a hill often lurked a lightless wagon. Truck breakdowns seemed to call for conferences and repairs well out on the road, without flare or lantern to serve warning. But worst of all was the problem of dimming our own headlights. Even on low beam, they invariably provoked an angry blinking of lights from oncoming traffic. Finally it dawned upon us that on approaching another vehicle we were not supposed to lower the beams, but to turn the headlights off entirely, driving by moonlight—if any. This may work with slow trucks; it puts a fast car in serious danger of hitting an unlighted obstacle.

Everywhere is the alert militiaman—not only at crossroads and in hamlets, but also standing on many a lonely country hilltop. Sometimes he has a motorcycle sidecar, complete with burp gun. The militiaman is cop, judge, court clerk all in one, for in the USSR, traffic court is held right on the road. Drivers who violate a traffic law pay their fine on the spot. The officer gives the offender a receipt and punches his driving license.

The third night of our trip south we

How Communism Threatens Russian Science

Condensed from "A Report on Science in Russia Today" by Dr. Tom Margerison, scientific editor of the British magazine The New Scientist, *who visited Russia about the same time as* POPULAR SCIENCE'S *Harry Walton.*

NOBODY who visited Russia without prior knowledge of her prominent position in science would dream that a country in which petty officialdom and inefficiency are still so evident could beat the world in the launching of earth satellites. Scientists are now probably the most pampered profession in Russia. They receive salaries as high as, or higher than, leading artists of the stage and screen.

The result is that there is great competition to join their ranks. The universities are inundated with students wanting to study science subjects. The prizes of an assured position, a salary sufficient to buy a car, and other comforts, spur the students to hard work.

One rather sinister fact about the education of Russian scientists is that at every stage in their career they are required to prove their competence in the Marxist-Leninist doctrine. Entrance to a university is reserved only for those who can pass their political examination. Entrance on a postgraduate course depends on the results of yet another political examination.

Trying to arrange a visit to a laboratory or research institute involves a series of tussles with officialdom. Inside, I might have been in any British university laboratory—but for the red banners, carrying Communist Party slogans in celebration of the fortieth anniversary of the revolution, plastered bizarrely across the walls.

Basic research in the Soviet Union is carried out mainly in the laboratories and research institutes of the Academy of Sciences, and of the 13 provincial academies. The budget for each institute seems to be flexible and, provided the Academy agrees, there is little difficulty in obtaining additional money for special projects.

The Academy thus wields very great power. Recently, it has been stressing the unity of the Party and the scientists, and has, apparently, been attempting to increase political activity among the scientists.

A. Topchiyev, the secretary of the Academy, said recently in an article in *Kommunist:* "To fight idealistic views and trends, tirelessly to expose idealistic conceptions, is the duty not only of representatives of the social scientists but also of scientists working in all spheres. We must energetically rebuff all revisionists of the Marxist-Leninist teaching. . ."

If this nonsense, written by one of the most influential men in the Academy, is to be taken seriously, it means that the future of Soviet science is less bright than most people believe. It means that the Communist Party is trying to set foot in the laboratories and gain control of them in the same way that it has been doing in the armed forces.

Science cannot be conducted in this way, and I am sure that the majority of the Russian scientists realize it.

Three things have brought Soviet science to its present thriving state. First, the government is prepared to spend money on it. Secondly, it gives scientists the privilege of a higher standard of living and greater freedom of movement than most other people. Thirdly, the scientific secretaries and administrators form a barricade inside which scientific thought flourishes without concern for the party line.

It looks as though this barricade may soon be swamped. If things go on in this way we may yet see a marked decline in the standard of Russian science.

Moscow's Manezh Square on a rainy day, Historical Museum and (top right) part of Kremlin.

stopped at what Salin, our guide, said was a resort hotel. (O'Connor, surveying the plumbing, dubbed it the Last Resort.) Zeleny Gai is a stop for the big through buses, diesels, that roll from Moscow to Simferopol with two relief drivers and loads of sober-faced Russian vacationists aboard. The hotel, only six years old, was already shedding plaster, and the plumbing was deplorable.

The road runs arrow-straight for miles south of Zeleny Gai. Looking at the rolling wheat lands, you could imagine yourself in the American Dakotas, until you ran across a knot of long-skirted, quilt-coated farm workers waiting for a bus or holding out a hand, palm up—a startling gesture that turned out to be the Soviet version of the hitch-hiker's thumb.

CAR WASH IN KHARKOV: This Intourist chauffeur hosed down the Rambler in the hotel yard.

Gas is where you find it in the USSR. And not just any gas station will do. Most dispense a low-octane juice as full of pings as borsch is of cabbage. We had to use it just once, and to the Rambler's eternal credit it swallowed the stuff, protesting mildly.

The "high-test" gas is 74 octane, available only from certain pumps in specific stations—and possibly only to tourists. On this the car ran fine; for we had asked the Brussels assembly plant to detune the engine to take it.

For those occasions when the special pump wasn't working or the tank was empty of 74-octane, we carried 20-liter jerry cans. They came in handy a couple of times, making it possible for us to go on rather than accept the liquid horrors that satisfy Russian engines.

Gas pumps (which, for some reason, you aren't supposed to photograph) are ancient, dirty, usually hand-operated. Some were made in Germany, possibly before World War I. As the operator works a pump lever, gas flows into one of two glass flasks, while the previously filled one drains its measured volume into the car.

From Simferopol to Yalta is only 100 kilometers, but the road climbs two mountain ranges and snakes through a valley between them. The highway narrows down, with some widening at curves, but shoulders drop off into gulleys and driving is a matter of sawing the wheel continuously, with hardly 300 feet of straight stretch anywhere.

What had been drizzle turned into rain as we began to climb. Clouds wreathing the peaks had descended as fog, so that we reached the city, a maze of narrow one-way streets, late, tired and irritable.

By daylight the mountain drive back north was easier and the scenery magnificent. In Simferopol a huge ditch down the main street was being filled in by some 30 good-looking girls, rather awkwardly wielding picks and shovels. When I produced a camera, they glowered and turned away. They were college students, giving a day's labor to the state. Perhaps they were unwilling to have a foreigner photograph what they thought might be construed unfavorably—or, more likely, plain female vanity was at work.

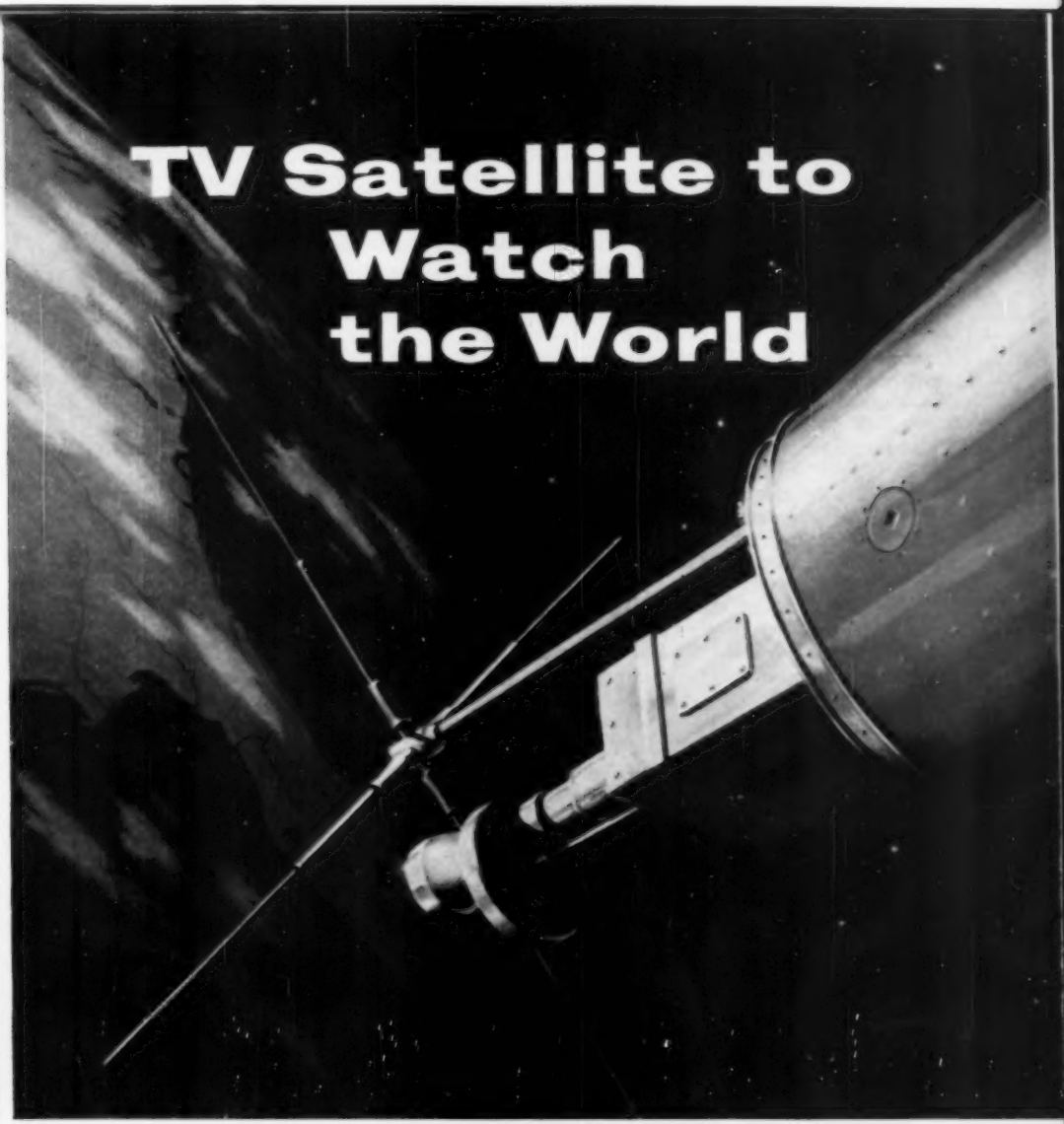
Farther north, we ran across evidences of private enterprise: women and children selling melons along the highway. As we passed a road-repair crew, a young woman bellowed enthusiastically at us. I asked what she had said. O'Connor translated: "What a car!"

To Russian officials, the Rambler was evidently a source of embarrassment. We were repeatedly asked to park it out of sight behind locked gates. In Kursk, a militiaman appealed to a large crowd: "Comrades, don't just stand here looking at this car. You have work to do. And you children should be going to school. Move on." Nobody budged—it was the militiaman who rather sadly moved on.

Outside a tiny village north of Zapo-

[*Continued on page 234*]

TV Satellite to Watch the World



U. S. scientists tackle the immense problems of launching a globe-girdling, "seeing-eye" satellite. Target date: any time

By Wesley S. Griswold
DRAWINGS BY RAY PIOCH

IN THE wake of Russia's Sputniks and our own Vanguard procession of space travelers, the U. S. is planning to shoot an electronic eye into the sky. This reconnaissance satellite, girdling the globe every hour and a half at a height of 500 miles, will be equipped to take pictures of the whole world.

The seeing-eye satellite, designed to acquaint us with many activities to which we are now largely blind, is officially called Pied Piper. Unofficially, and much more aptly, it is called Big Brother. That

was the name of an all-seeing, all-hearing world dictator in George Orwell's prophetic and chilling novel *1984*.

The secrecy shrouding details of Big Brother is as hard to penetrate as that which hides the goings-on in the Kremlin. It has been reliably reported, however, that Lockheed Aircraft Corp. has been assigned to build the satellite and the multiple-stage rocket vehicle to transport it, that CBS and Eastman Kodak have been given the task of enabling it to see, and that Rocketdyne, a division of North American Aviation. and Aerojet-General Corp. will provide the mighty engines to boost it into its orbit.

When may we expect Big Brother to start giving us passing glances from 500 miles above? According to Air Force insiders: any time. Since the Russians are known to be at work on a similar project, Big Brother's debut will be speeded up.

What are some of the problems that must be solved before we can launch a reconnaissance satellite? What will it see?

I sought the answers from many working scientists, not all of them willing to be publicly identified. Here are the questions I asked and the answers I got:

Do we have rocket engines powerful enough to lift Big Brother into place?

That depends on how much it will weigh, and nobody close to Big Brother is giving out any figures. However, there have been educated guesses that a satellite weighing around 100 pounds *could* carry a small TV camera, miniaturized transmitter and their source of power.

Do we have rocket engines capable of heaving a 100-pound satellite into an orbit?

Indeed we do. A quick way of estimating the capacity of the engine needed to do the job is to apply this rough rule-of-thumb: For each pound of satellite, you need 500 to 1,000 pounds of thrust. Even the original German V-2 developed 56,000 pounds of thrust.

"We now have rocket engines with many times the thrust of the V-2," said Paul R. Vogt, assistant chief engineer of Rocketdyne, which builds engines for the Atlas, Jupiter, Thor and Redstone missiles. "And there is no basic limit to the size of rocket engine that can be built."

We could have fired a rocket to the moon before now if we had had a good reason to do so. Maj. Gen. Bernard A. Shriever, head of the U. S. intercontinental-ballistic-missile program, has said that Atlas' power was sufficient to drive a payload of *several thousand* pounds beyond the pull of the earth's gravity. But sheer rocket power is not so important as the efficiency with which it is used in a particular vehicle.

Can we build a useful reconnaissance satellite that will be light enough to be put in an orbit?

"It would take a marvel of miniaturization," said John A. Burrell, manager of technical operations for NBC's Western Division. "It's conceivable, of course, that with the use of transistors you could make a very light camera and a synchronizing generator that would weigh only 10 or 12 pounds.

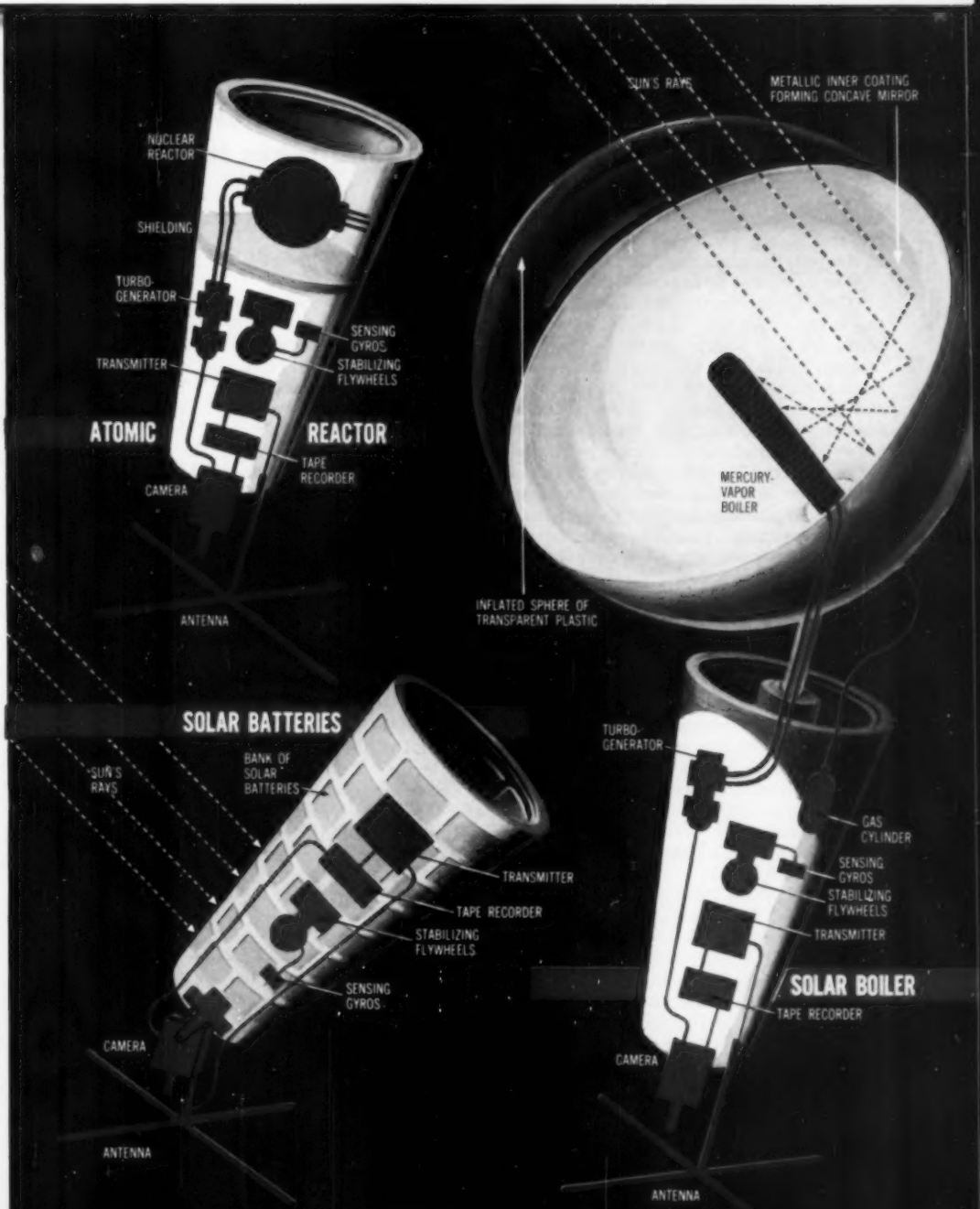
"What about optics? The wider the angle of lens, the smaller and lighter the lens will be. But the broader the view, the less detail you'll get in your picture. Assuming that we'd want to magnify what the TV camera sees, we'd have to use heavier, longer lenses. There would have to be some means of stabilizing the camera in space, and servo-operated equipment, remotely controlled, to swing it, keep it trained on the earth and adjust its focus. That would greatly increase the satellite's load.

"The real bind, though," Mr. Burrell said, "would come in trying to get a microwave transmitter small enough and yet powerful enough. The smallest suitable transmitter I know of weighs at least 1,500 pounds. Even assuming some genius could miniaturize this to 150 pounds, you'd need 1,500 to 2,000 watts of power to send a good video signal back to the earth from a height of 500 miles."

This estimate of the needed power—a figure all-important to choice of power source, and hence to the whole design—is much higher than some. For instance, as little as 100 watts was recently suggested as sufficient for a TV space vehicle by Prof. S. F. Singer, University of Maryland physicist.

What kind of orbit would a reconnaissance satellite have?

If it is to see *all* of the earth at one time or another, and not just part of it, its carrier rocket will have to be launched at right angles to the equator. Thus the rocket will need more power and be harder to aim than Vanguard's rocket, which,



HOW WILL "BIG BROTHER" BE POWERED? Source of current for TV transmitter, for which conventional batteries would be too short-lived, will determine satellite's outward appearance. Sketches suggest three possibilities open to scientists: a nuclear reactor; solar batteries; or a solar boiler, shown as a composite of several proposed designs.

"It could watch and direct a guided missile unerringly from the launcher to a target

launched eastward from Florida, gets a 900-m.p.h. boost from the earth, traveling in roughly the same direction.

What will Big Brother be able to see?

"Once the reconnaissance satellite is on the wing," says Dr. Heinz Haber, noted physicist and space scientist, "meteorologists will be able to watch cloud formations and the origin of major storms. Cold and warm fronts, squall lines, thunderstorms, hurricanes and tornadoes can be followed up and their courses predicted.

"We are still pretty much in the dark as to how the huge weather machine works," he continued. "The glassy eye of a TV camera in space can soon tell us how to save countless lives and dollars that violent, unexpected changes in the weather now wipe out."

Will the seeing satellite be able to detect objects smaller than countries and vast cloud formations?

It should be able to see ships and planes, detect forest fires and watch the wanderings of icebergs, Dr. Haber believes. His thoughts are entirely of its peaceful, beneficial applications. He sees it especially as a marvelous aid to transoceanic traffic control, both on the surface and in the air.

But won't it have great military value, too?

Some scientists think so. And military men think of the satellite primarily as a means of taking frequent looks at a potential enemy's territory—200,000 square miles at a glance. They believe it will be able to spot troop and fleet movements almost as soon as they start. They believe it could watch and direct a guided missile unerringly from the launcher to a target thousands of miles away. They are confident that it will detect atomic tests, the construction of airfields and big industrial plants. It will be an invaluable means of remapping the world, with greater accuracy than has ever been possible before. It will pinpoint the locations of bases whose whereabouts are not known precisely now. Even if cloud cover or darkness should hide these vital installations during a few of Big Brother's flybys, they will be caught in full sunlight sooner or later.

How could we power a TV transmitter in outer space?

The most obvious source is the sun. But solar batteries at their present stage of development are weak. They could supply a very modest amount of power, which might be adequate if a TV transmitter could be operated on as little as 100 watts. But if it called for the higher estimate of 1,500-2,000 watts, the required number of solar batteries would be of prohibitive bulk and weight.

Dr. Wernher von Braun, renowned authority on rockets and the problems of space travel, suggests a solar boiler. He proposes a system of concave mirrors with little mercury-filled pipes attached to them. The mirrors would catch the sun's rays and the mercury would carry off the intense heat to run electrical generators. These, he estimates, would develop 12 kilowatts of power, a generous supply for a reconnaissance satellite. Whether such a design could be kept within a reasonable weight limit is problematic.

Could we use nuclear power to run the satellite's transmitter?

It seems difficult; though a reactor only a foot in diameter, containing four gallons of fissionable material, has been built. Even the tiniest practical reactor would have to be teamed with a heat exchanger and a generator in order to produce electricity. This would be a heavy combination for the satellite, even if shielding were left off the reactor. Another problem: Radiation from an unshielded reactor might injure the satellite's TV equipment even though, at a height of 500 miles, it would be no threat to humanity.

What will Big Brother look like?

It will probably be the final stage or nose cone of the carrier rocket. Its TV eye might be set in the tip of its nose. The lens can be protected during ascent by a ceramic cap, to be blown off by a small explosive charge when Big Brother arrives in its orbit. Or it might prove desirable to have the lens in the middle. Small flywheels, von Braun suggested,

thousands of miles away"

could keep its eye fixed on the earth.

Would Big Brother have a radar scanner?

At that height, no present-day radar could provide meaningful pictures.

How are we going to receive television pictures that the satellite has taken on the opposite side of the world?

They will be automatically stored on magnetic tape—already used to record TV programs. Then, when Big Brother swings into sight and range of our recieving antennas, a radioed command will start the tapes transmitting what the camera saw half a world away.

Would it be possible to jam telecasts from the satellite?

Yes. It is far easier to track down and interfere electronically with TV transmitters than with radio transmitters.

Will it be feasible to use film-carrying cameras on Big Brother?

So far as the actual picture-taking is concerned, yes. It would not be much harder to take unblurred shots of the earth from a vehicle traveling 18,000 m.p.h. at a distance of 500 miles than it is to take them from a jet plane flashing over the landscape at treetop height. Sharp, detailed photos have often been obtained from low-flying planes moving several hundred miles an hour.

The acute problem would be that of retrieving the exposed film. If it can be detached and sent down (i.e., slowed and put in a "decaying orbit") without being incinerated by the friction of its fall to earth, there still remains the job of finding it when it lands. After that comes the puzzle of how to load fresh film up there.

Could Big Brother take infrared pictures at night?

Not now, and not from that height. Infrared photography hasn't yet been made effective enough.

Wouldn't tiny meteorites pit and cloud the lens of a satellite's camera?

Probably, though it might take quite a while for them to interfere seriously. Besides, there is a relatively simple way out of this difficulty. Dr. Haber suggests making use of a camera with rotatable lenses and with a photocell to warn when a lens is becoming even slightly obscured. The photocell could then trigger a mechanism to rotate a new lens into place.

POLAR ORBIT of "Big Brother" satellite, contrasted with less-far-ranging orbits of Russia's Sputniks and of U. S. Vanguard "moons," will let it view entire surface of earth.

What will a reconnaissance satellite mean in international relations?

Obviously no nation will stand for this kind of snooping unless it has the right to reciprocate—or unless it doesn't know.

A reconnaissance satellite might be painted dead black and launched secretly, without radio beeps to give itself away and with its orbit known only to its launcher. It might conceivably take its pictures in secret for a long time. But once it was discovered and its orbit plotted, it could quickly be put out of commission—not by an atomic bomb but by buckshot!

The indignant nation that found it out need only prime a rocket with a big load of lead or steel pellets and a small explosive charge and launch it into the same orbit with the satellite, but headed in the opposite direction. This could be done on the opposite side of the world, with the charge set to explode a quarter-turn away from its target. Thenceforth, on each successive wheel around the earth, snooper and shot would collide at an impact velocity of around 36,000 m.p.h. It wouldn't be long before the satellite was reduced to a cloud of metal shreds, circling the earth aimlessly. END

Will Your Next House

Here's a man who keeps his house warm with a factory-built solar-heat system that forecasts fuel savings of 80 percent

SOLAR-HEAT COLLECTORS on a model of his house are pointed out by Dr. George O. G. Löf. On the finished house (photo at top) they are less noticeable, blending agreeably with its lines.

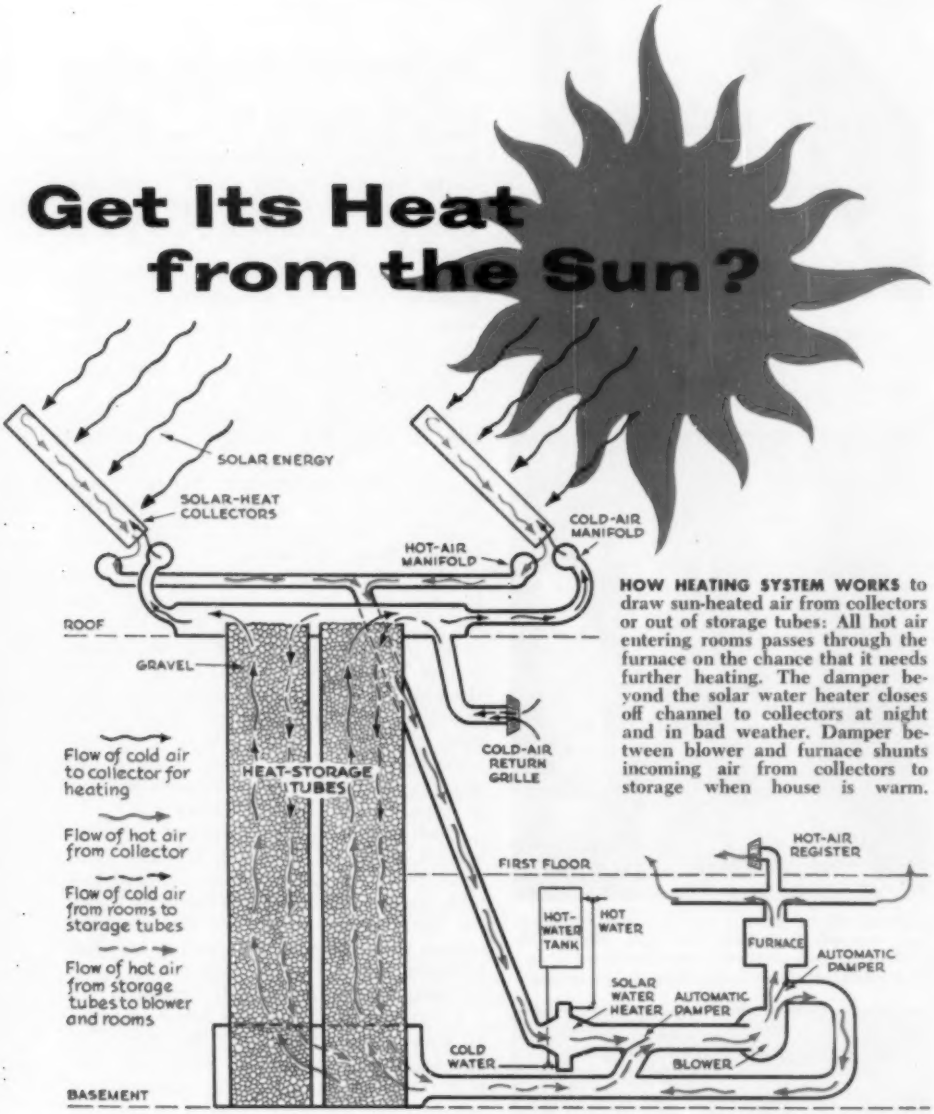
ONE clear, cold day early this winter, I walked into a cozily warm nine-room house in Denver and learned an amazing fact. At that very moment, the heat so comfortably abundant in the big new contemporary home was costing the owner of the place absolutely nothing. The sun, pouring unlimited energy upon eastern Colorado, was providing every last calorie of it.

A few minutes later, it did even more. It began to supply the house with surplus heat, to be stored for use that night.

I *heard* it happen. I was standing beside the conventional-looking furnace, in a basement area not noticeably different from any other modern utility room. Suddenly a switch clicked, a damper closed with a metallic exclamation, and the electric blower in the hot-air heating system began to work twice as hard.

My host, Dr. George O. G. Löf, a con-

Get Its Heat from the Sun?



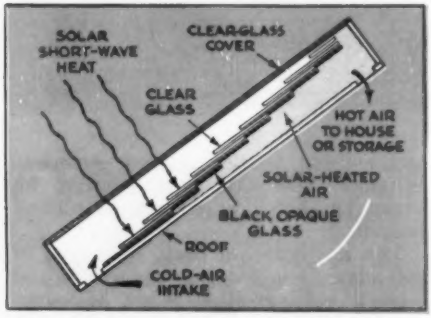
HOW HEATING SYSTEM WORKS to draw sun-heated air from collectors or out of storage tubes: All hot air entering rooms passes through the furnace on the chance that it needs further heating. The damper beyond the solar water heater closes off channel to collectors at night and in bad weather. Damper between blower and furnace shunts incoming air from collectors to storage when house is warm.

sulting engineer, turned to me with a pleased look. "The house has got all the heat it wants right now," he explained. "Since the thermostats aren't calling for more, the sun-heated air from the collectors on the roof is automatically being shunted into storage."

Dr. Löf, a tall, lean, red-haired man of 43 who is a solar-energy expert of international reputation, had a right to look pleased. He had designed the novel and efficient heating system. American Window Glass Co., of Pittsburgh, for whom Dr. Löf is a research consultant, built it.

The Löf home—a lively household of two adults, four energetic youngsters and a black cocker spaniel—is not, of course, the first in the U. S. to be heated by the sun. There have been at least half a dozen others—all odd looking, because they were primarily outsize collectors of solar energy

SURPLUS SOLAR HEAT is stored in these two 16-foot, house-high tubes. They are filled with 10 tons of coarse gravel. Rooftop view (top) shows how air ducts and storage tubes connect.



OVERLAPPING GLASS PLATES within collector panels trap sun's heat. Solar "furnaces" on roof are 50-foot aluminum frames holding 20 panels, each measuring six feet high, 2½ feet wide.

with living quarters attached to them.

But the attractive residence of the large and happy Löf family is unique in two respects: (1) It is the first American house to have a solar-heating unit as optional equipment that didn't dictate and distort the design of the house to suit its needs. (2) Its solar-heating unit was the first to be factory-made.

Thus the Löf home may very well make housing history. It represents a decisive step away from the laboratory toward the day, perhaps five to 10 years from now, when solar-heating will be the most practical kind for thousands of homes.

If your eyes weren't searching the rooftops, as mine did, for signs of solar-heat collectors, I don't think you would very quickly single out the Löf's $40,000 house from among its comparably expensive neighbors in Cherry Hills Village, a suburb southeast of Denver.

That large, low, square enclosure on the roof, seen from a distance, might easily be mistaken for a sun deck. Even at close quarters, the two long aluminum frames of glass panels that stretch across the roof enclosure, parallel and a few feet apart, aren't scene-stealers. They don't protrude very far above its rim, because they face the south at an angle of 45 degrees, to catch the maximum amount of energy from the low winter sun.

Each panel in the collectors contains several plates of specially treated, nonreflective glass, partially overlapping but with quarter-inch air spaces between them. As the radiant energy of the sunlight strikes these glass plates, heat is trapped between them. Panel temperature, even in winter, may rise to 250 degrees F.

Then cool air from the house, pushed up there through ducts by the blower in the basement, enters the collectors and is blown through the narrow passageways between the plates of glass. The moving air "wipes off" the heat and carries it either to the rooms below or into storage.

The collectors don't demand housekeeping attention. Snow slides off them of its own weight, and atmospheric dirt, in the clean air of Denver, doesn't accumulate on them enough to lower the efficiency of the collectors' glass.

Inside the five-bedroom house, expansive in looks and spirit, bright with picture windows, there is only one evidence of the unique heating system.

In a broad, oak-paneled stairwell leading to the basement from just inside the main entrance stand two massive Chinese-red tubes, 16 feet tall, three feet in diameter. They are majestic in simplicity and size. Behind the stair landing, they stretch from cellar to roof. These are the storage chambers for surplus solar heat. Though you wouldn't believe it until you touched one, they are made of fiberboard, and they are filled with thousands of small chunks of rock. This coarse gravel holds the heat as long as 24 hours.

It was the architect—James Hunter, of Boulder—who wisely suggested that the Löfs not try to disguise the storage chambers, but paint them a vivid red. It glows warmly against the oak walls.

When the collectors on the roof are gathering more heat than the house needs at a particular time, the excess is forced into the storage chambers at the bottom. (The furnace blower speeds up to do this job in order to overcome the resistance of those columns of rock.) This naturally drives off any cold air at the top of the storage chambers, pushing it along into the collectors to be heated and then returned to the other end of the tubes.

At night or on cloudy days, the solar collectors are bypassed. Then, whenever the room thermostats signal for more warmth, the blower draws stored solar heat out of the storage tubes from the bottom. This warm air is blown through the furnace, where, if it is not hot enough to satisfy the thermostats, an auxiliary gas burner turns on automatically to heat it.

Beyond the easy task of learning to like the storage chambers, the Löfs have not had to make any concessions to their unique heating system. They have all the windows they wanted—a lot, for the house stands on rising ground with a 150-mile-wide view of the Rockies. There are 17 picture windows, 10 others of more normal size. All have double panes—a precaution any homeowner is likely to take in that climate.

The cold-air-return grilles and hot-air registers throughout the Löf house are conventional and unobtrusive.

The furnace room looks normal, but there are two water tanks. A small heat exchanger is connected to the larger (80-gallon) tank. As hot air from the solar collectors is drawn down from the roof, it passes over water-filled coils in this exchanger, heating the domestic hot water, which enters the 80-gallon tank. Water warmed this way then flows on into a smaller (60-gallon) tank, equipped with an automatic gas heater. If the water by now is as hot as the thermostatic control demands, it is distributed to the house just as the sun warmed it. If it is not hot enough when it arrives in the smaller tank, the burner quickly brings it up to the required temperature.

Thus, in sunny weather the gas burners in the furnace and in the smaller water tank are called upon only if the solar-heated air and water need a few additional degrees of temperature. At night, during spells of fair weather, there is almost always solar heat in storage to draw on, even during a cold snap. During cloudy or stormy weather that persists more than a day, the house's standby gas furnace has to shoulder the burden.

It will never be practical to try to heat a house in a cold climate entirely by the sun, Dr. Löf says. To do so would require a solar-heating system so large that it would cost much more than the combination of solar and conventional heat that he is now using. In the Denver setup, the furnace and auxiliary fuel carry a modest fraction of the heating load.

How much does it cost to heat a house by this fuel teamwork? It is far too early to say, Dr. Löf told me. Both he and American Window Glass Co. say they must accumulate a lot more data and much longer experience with their system to make dependable estimates.

This first solar-heating unit cost much more than it would if it were being mass-produced. Ten years from now, Dr. Löf predicts, the price of the solar portion of a typical house's heating system may be trimmed to $1,000.

By the late 1960s, he says, the cost of fuel for heating a house by the method American Window Glass is now pioneering should be only one-fifth as much as the cost of heating by conventional methods in the same locality.

Dr. Löf intends to link an air-conditioning system to his solar-heating unit, using the sun much as gas is used to chill a refrigerator. When that happens, to change over from heating to cooling their house, the Löfs will merely throw a couple of switches.—*Wesley S. Griswold.*

Seated at Centralized Traffic Control board, Milwaukee Road train dispatcher Bill Kelly sets

The Robot That

Milwaukee Road's big brainbox puts 240 miles of high iron under the dispatcher's thumb

By Henry B. Comstock

IN THE little railroad town of Perry, Iowa, a train dispatcher nightly plays one of the world's hottest transportation symphonies. His keyboard is the large Centralized Traffic Control machine now designed for one-man operation.

Seated within reach of 400 miniature levers, toggles and buttons, the Milwaukee Road dispatcher can throw a massive track switch located 210 miles to the east, or change the color of a searchlight signal 120 miles to the west. The big machine shows him the location of every train on the high iron between Green Island, on the Mississippi River, and Council Bluffs, on the Missouri. It gives an emphatic ping each time one of these trains clears a switch, and flexes a robot hand to jot down the exact time with a fountain pen. It indicates which way the switches are lined up at turnouts, and what signals are being displayed. It brings in the voices of trainmen calling from trackside phones,

up signals and switches clear across the State of Iowa for 11 world-famous streamliners.

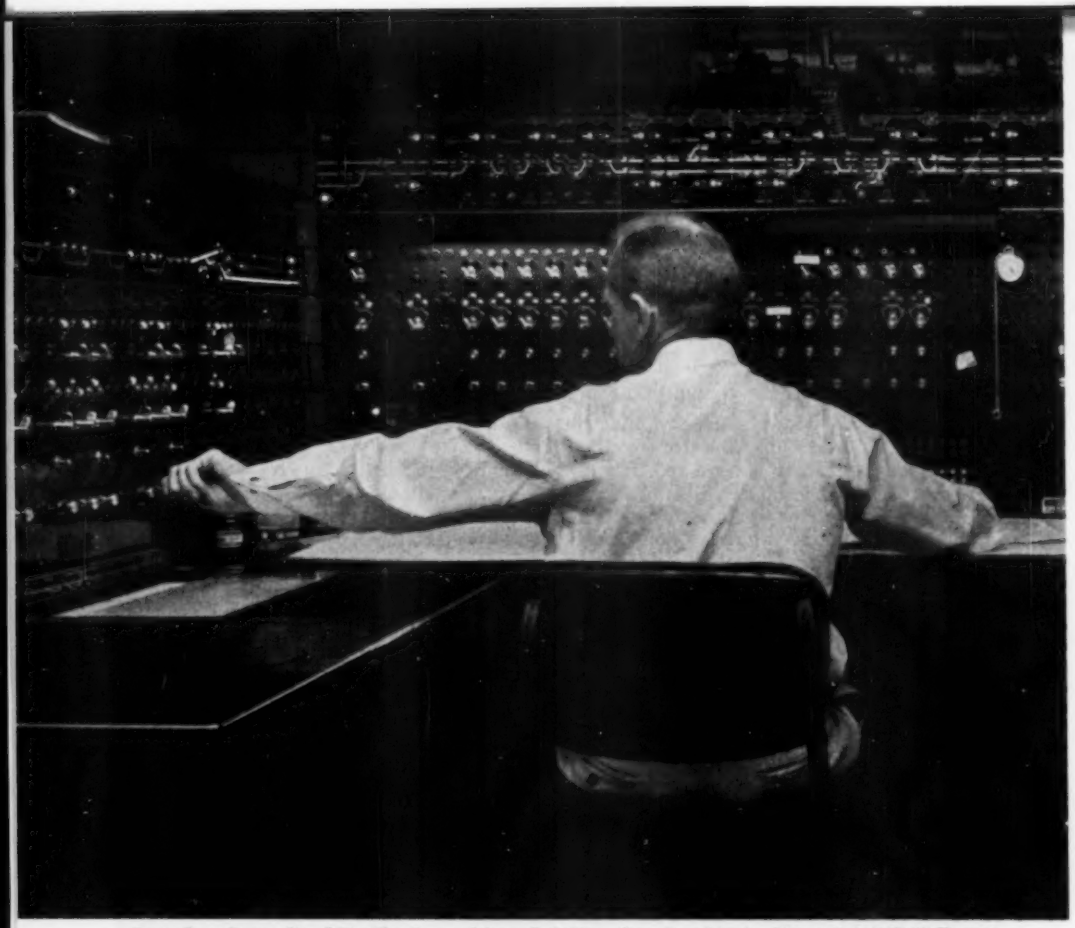
Runs a Railroad

of enginemen riding high in the cabs of streamliners and mile-long freights, even of the walkie-talkie-equipped signal maintainers who ceaselessly tend this fantastic machine.

We watched this CTC machine at Perry put on a late, late show recently with 11 of America's most famous "name" trains. Rain, one degree above sleet, was slashing at the station platform as PS photographer Bob Borst and I made a run for the dispatcher's office. "Nice weather for indoor shots," Bob shouted.

But Milwaukee Road's supervisor of signals and communications, R. R. Mc-

"CITY OF SAN FRANCISCO" takes on water just outside the dispatcher's office in Perry.



Seated at Centralized Traffic Control board, Milwaukee Road train dispatcher Bill Kelly sets

The Robot That

Milwaukee Road's big brainbox puts 330 miles of high iron under the dispatcher's thumb

By Henry B. Comstock

IN THE little railroad town of Perry, Iowa, a train dispatcher nightly plays one of the world's hottest transportation symphonies. His keyboard is the largest Centralized Traffic Control machine ever designed for one-man operation.

Seated within reach of 269 miniature levers, toggles and buttons, this Milwaukee Road dispatcher can throw a massive track switch located 210 miles to the east, or change the color of a searchlight signal 120 miles to the west. The big machine shows him the location of every train on the high iron between Green Island, on the Mississippi River, and Council Bluffs, on the Missouri. It gives an emphatic *ping* each time one of these trains clears a switch, and flexes a robot hand to jot down the exact time with a fountain pen. It indicates which way the switches are lined up at turnouts, and what signals are being displayed. It brings in the voices of trainmen calling from trackside phones,

up signals and switches clear across the State of Iowa for 11 world-famous streamliners.

Runs a Railroad

of enginemen riding high in the cabs of streamliners and mile-long freights, even of the walkie-talkie-equipped signal maintainers who ceaselessly tend this fantastic machine.

We watched this CTC machine at Perry put on a late, late show recently with 11 of America's most famous "name" trains. Rain, one degree above sleet, was slashing at the station platform as PS photographer Bob Borst and I made a run for the dispatcher's office. "Nice weather for indoor shots," Bob shouted.

But Milwaukee Road's supervisor of signals and communications, R. R. Mc-

"CITY OF SAN FRANCISCO" takes on water just outside the dispatcher's office in Perry.

"It's kind of like a piano with its keys so interlocked you couldn't possibly strike a sour chord with them"

Conahay, had other ideas. As soon as he had helped us stow our cameras and tape recorder in the chief dispatcher's office he tossed us a couple of slickers.

"Before you have a look at the board," he said, "I want to drive you out to Herndon, 12 miles west of here, to see how close a dispatcher times his meets with CTC."

As we sizzled along the dark highway, McConahay filled us in on the Iowa Division setup.

"Time was," he said, "when we had double track most of the way across the state. Now we're handling more traffic than ever with only one. CTC does the trick by giving a dispatcher a moment-to-moment picture of what's happening out on the road, and making him his own switch tender. That way he can put trains around each other on sidings with split-second efficiency and a minimum of track.

"Pulling up one set of rails pays off three other ways—reduced operating costs, less track maintenance, and a nice cut in taxes because, once we remove a track, the roadway beneath it reverts to unimproved property. Add them all up and this is a good investment, even though it cost the Milwaukee around $14,000 a mile."

"FIELD LOCATIONS" like this shed receive orders transmitted by the CTC machine and convert them into the electronic muscles that throw track switches and change signal indications.

McConahay turned off the main drag and headed west along the shoulder of the right-of-way. Two hundred yards ahead, a searchlight signal tossed two spears of red light over our heads and on toward Perry.

"Shows what the right reflectors and lenses can do for a couple of eight-volt bulbs," McConahay said as he stopped the car. "That board is set against Number 111—the 'City of Denver.' Beyond the signal, the two tracks beside us narrow down to one. You'll notice the signal across the way is showing red-over-green. That's for Number 20, our eastbound 'Arrow.' Red-over-green means the dispatcher is going to put her on Number 2 track. If the board showed green-over-red, the switch would be lined for Number 1."

"You mean trains don't always hold to the right at turnouts?"

"Not with CTC. We run 'em whichever way suits us best. At Perry, for example, we put both east- and westbound passenger trains on Number 2 track whenever we can, because it's nearest the station."

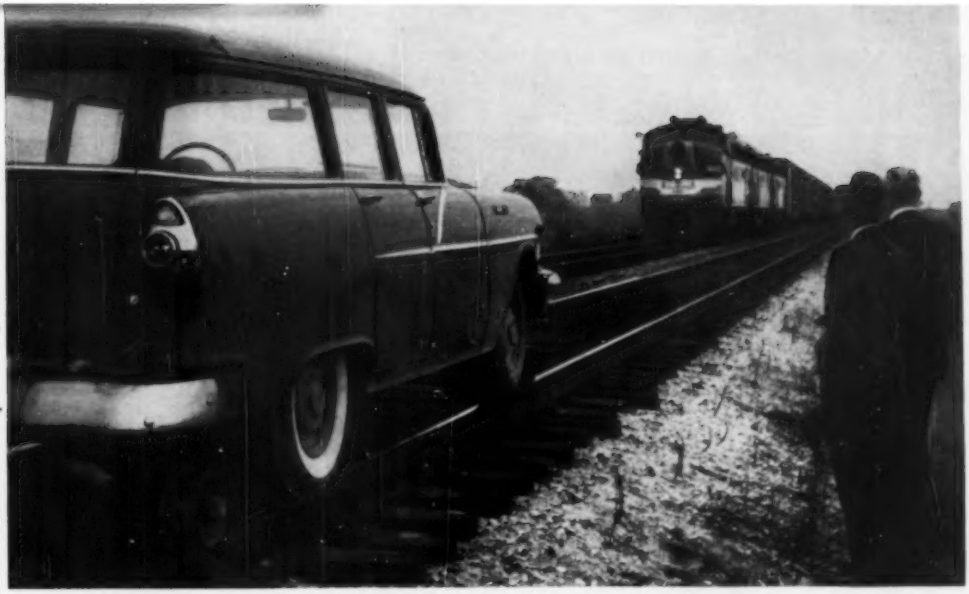
"Could a dispatcher set up the switches for a head-on collision?"

McConahay shook his head. "He could try, but the CTC machine wouldn't let him. It's kind of like a piano with its keys so interlocked you couldn't possibly strike a sour chord with them."

He pulled out his watch and turned its bold numerals to the map light under the dash. "10:13. Number 20 should be showing in about two minutes. She's due here at 10:20."

He was off by 10 seconds. At 10:14:50 Bob pointed to the west and said, "Here comes Sputnik!"

A wobbly little blur of light had just tipped the horizon. It was a good three minutes before it broke in two and became a pair of locomotive headlights—the top one steady, the one below it painting the rain with violent cross-strokes.



RAIL-RIDING PONTIAC used by division superintendent Jim Hayes is too light to operate block signals. Dispatchers protect it with signals controlled from the CTC machine.

"Best crossing warning ever invented," McConahay said. "When we first started using those oscillating beams, folks slammed their cars in reverse and dug out fast. They figured our trains had jumped the tracks. Now, look behind you."

Away off to the east was another little Sputnik.

The CTC machine had done a nice job of orbiting. The "Arrow" crashed by us right on the advertised, a blur of barred mail-car windows, followed by the flicker of dimly lighted coaches and sleepers. A moment later the upper signal on the mast beside us winked from red to green.

"Dispatcher's just given the 'City of Denver' the single track," McConahay explained. "A light on his panel told him the instant Number 20 cleared the switch."

The "City" train was in a hurry. She bore down on us with her airhorn braying hoarsely for the crossing. At 10:23 she was only a puddle of rear-end lights and the wave of a flagman's lantern.

"Guess we could do with a cup of hot coffee about now," McConahay said. "But there's one thing more you should see before we head back to Perry."

He wheeled the car around, returned to the crossing, then doubled down the other side of the right-of-way to the signal facing west. A few yards distant was a welded sheet-metal shed, with a phone box on a pole beside it. We climbed out of the car. McConahay unlocked the shed door with his switch key and snapped on the lights. Inside, the air was filled with the hum of trickle chargers keeping the soup up in a bank of wet-cell batteries. Above them, shelves loaded with relays lined the walls.

"We call this a 'controlled field location.'" McConahay said. "There are 60 others like it strung along the Iowa Division. In effect, they're the robot switchmen and telegraph operators of our CTC setup. When the master machine in Perry says, 'I want to throw the switch for Number 2 track at Herndon,' the order goes over our carrier wires in the form of a 16-unit signal—a combination of dots and dashes that every other field location on the line ignores. But three little relays in that glass-windowed box to your left give themselves a sudden nudge. 'Hey, boys,' they say, 'that's us!'

"So they snap closed, and this passes the word along to a succession of other interested relays. Between them, they close the circuit, and a 24-volt battery pours a shot of DC juice into the switch motor. It takes that motor exactly 14 seconds to move three tons of steel from one

[*Continued on page 250*]

T-Bird Now Totes Four

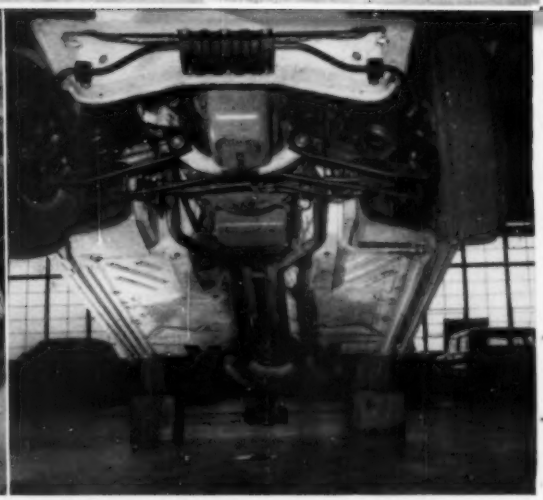
Longer but low as ever, it has plenty of headroom, adequate luggage space—and more than family resemblance to the Continental's well-bred beauty

By Devon Francis

LAST month the Ford Motor Co. did something that is going to outrage a lot of people. It junked its two-seater Thunderbird. At the same time, it did something that is going to delight a lot more people. It brought out a four-seater Thunderbird.

The new T-bird is a hardtop. It's longer, heavier and a lot roomier than its predecessor. It's powerfuller. It's built differently. In appearance, it's a sort of vest-pocket Continental Mark II. Fine so far—

ENGINE OF 300 HORSES gives Thunderbird a weight-power ratio of 12.8 pounds-to-one. T-bird's 3,848 pounds may be trimmed.



UNITIZED BODY—like those used by Lincoln and American Motors—lowers floor, makes room for exhaust pipes in transmission tunnel.

but that isn't the real story of the new Bird. I'll tell you some things that even Ford insiders aren't saying out loud. But first, the vital statistics.

Overall length is 205.4 inches. That's about 3½ inches longer than a 1958 Ford Custom 300. Wheelbase is 113 inches. That's up from the two-seater's 102, but is several inches shorter than the wheelbase of a Chevy, Ford or Plymouth.

Width is 77 inches. That's an inch shy of the Ford's. Height is 52.5 inches—practically that of the old hardtop two-seater—but 4½ inches lower than a Ford Custom 300 or a standard Chevy. It's four inches lower than a standard Plymouth.

Yet the Bird's passenger headroom, front and back, comes—astonishingly—to within a fat inch of that in the Plymouth, roomiest of the Big Three. Nor is the ground clearance sacrificed. It's more than six inches. That compares with less than six in the Ford, 6.8 in the Chevy and 5.4 in the Plymouth.

Power? Each of the T-bird's horses has to tote 12.8 pounds of car.

For comparison: the heftiest Chevy, 12.3; Ford, 11.9; Plymouth, 11.1; Caddy Special, 16.4; Lincoln Premiere, 13.1.

This implies that the new T-bird is a pretty heavy car. It is. With that 300-horse engine, it weighs 3,848 pounds (compared with 3,622 for a Fairlane 500 two-door hardtop) standing empty at the curb. That's too much, and the Ford people plan to do something about it. Well, there you are.

How did all this come about? To get at the whys and wherefores, you have to understand the way Ford tycoons work. With most other Detroit manufacturers, a car is designed and styled, and then (inevitably) the top brass begin talking it over at home. Presently a reigning vice president will come bustling into his office on a Monday morning and announce, "The seats have got to be an inch higher." That's not him talking, it's his frau. The seats *are* made an inch higher, too.

Nothing like that happens at Ford Motor. They do everything by market surveys. If a market survey should show that U. S. motorists want raccoon tails on their radio antennas, you can bet your bottom dollar that Ford would put a raccoon tail on every radio antenna. It's the way they think.

The first T-birds were marketed in the fall of 1954. By early spring, 1955, Ford had begun a market survey of the product. What did owners like about it? What *didn't* they like? Ford wasn't satisfied with the results of its own survey. It hired some outside people to do a survey of its survey. Before the frost was on the pumpkin, Ford had its answers:

T-bird owners were utterly batty about their cars, but they wanted:

1. More entrance room.
2. More luggage room.
3. Room for more passengers.

LUGGAGE COMPARTMENT, with centered spare, offers utilitarian hauling room—22 cubic feet worth (Ford Custom 300 has 28.9 cubic feet).

BETWEEN-SEATS CONSOLE atop the transmission hump contains heater controls, ash tray, radio speaker, switches for electric windows.

The Ford brass said to its stylists, "If you had $100,000 to spend on a custom body, show us what you'd build." It said to its engineers, "Dream us up a four-passenger Bird." It said to the stylists, "And, oh yes, don't destroy the looks of the Bird." It said to the engineers, "And, oh yes, while you're at it, make the body and frame in one piece, and put in coil springs because we'll use air springs maybe, and be sure to leave room for air-conditioning."

So they did.

When the original two-seater Bird was introduced, Ford hadn't known how to characterize it. Lewis Crusoe, division general manager at the time, christened it a "personal car." The Bird wasn't designed as a sports car, and it wasn't one.

Nor, by any stretch of the imagination, is the new Bird. But the Ford people know what to call it now—and thereby hangs the story that I promised you. The car is simply a four-passenger, two-door pillarless sedan that was designed to be 52.5 inches high.

Nothing like it, in a production car, is made in this country. The "sports-type" cars styled by Chevy, Pontiac, Studebaker-Packard, Chrysler, Plymouth, Dodge and De Soto bear no resemblance to it. Chrysler toyed with the idea in its French-designed experimental Facel Vega three years ago. Cadillac had something related to it in its display LaSalle at the GM Motorama in 1955.

These cars and the new T-bird are not only a departure from current sedan design—in some respects they represent a reversal of it. For years, most cars have become ever-bigger, ever-bulgier, ever-gaudier. The Bird packages four persons, no more. It's sleek. Its ornamentation is almost severe. Boasted a Ford spokesman: "We put the styling in the contour of the metal itself, not in the trim." Only the horsepower bulges, and perhaps someone at Ford will be smart enough to reduce that to a palatable and economical size.

Production of the four-seater has not been without its problems. The huge hood, eight inches wider than a standard Ford's to accommodate that engine, tended to flutter at high speeds and had to be beefed up. The car was "over-designed," and considerable weight must still be scalpeled out of it. The big engine imposes so much weight on the front wheels that steering without a power assist is a sweaty wrestle.

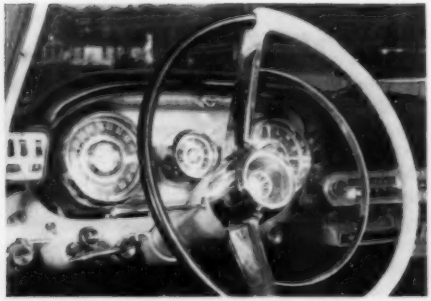
But the new Thunderbird remains, like the Mark II that it somewhat resembles, a stylist's dream in elegant simplicity.

It's not likely that production facilities will permit many more than 25,000 T-birds to be turned out in 1958.

But when at day's end the men in charge of the Thunderbird project climb aboard their low-slung chariots in the executive garage, homeward-bound, it doesn't take a telepathist to read their minds: "In passenger cars, here's the shape of things to come." END

New 300 is built on its own chassis, with basic Windsor body and special grille. Power: up.

Chrysler 300D Has Built-In Roar



SPEEDOMETER registers up to 150 m.p.h.—which is little exaggeration of potential. On straightaway, car has hit up to 144 m.p.h.

DOUBLE-WRAP WINDSHIELD is most obvious change for 1958. From start, the car has been notable for sparse use of chrome ornamentation.

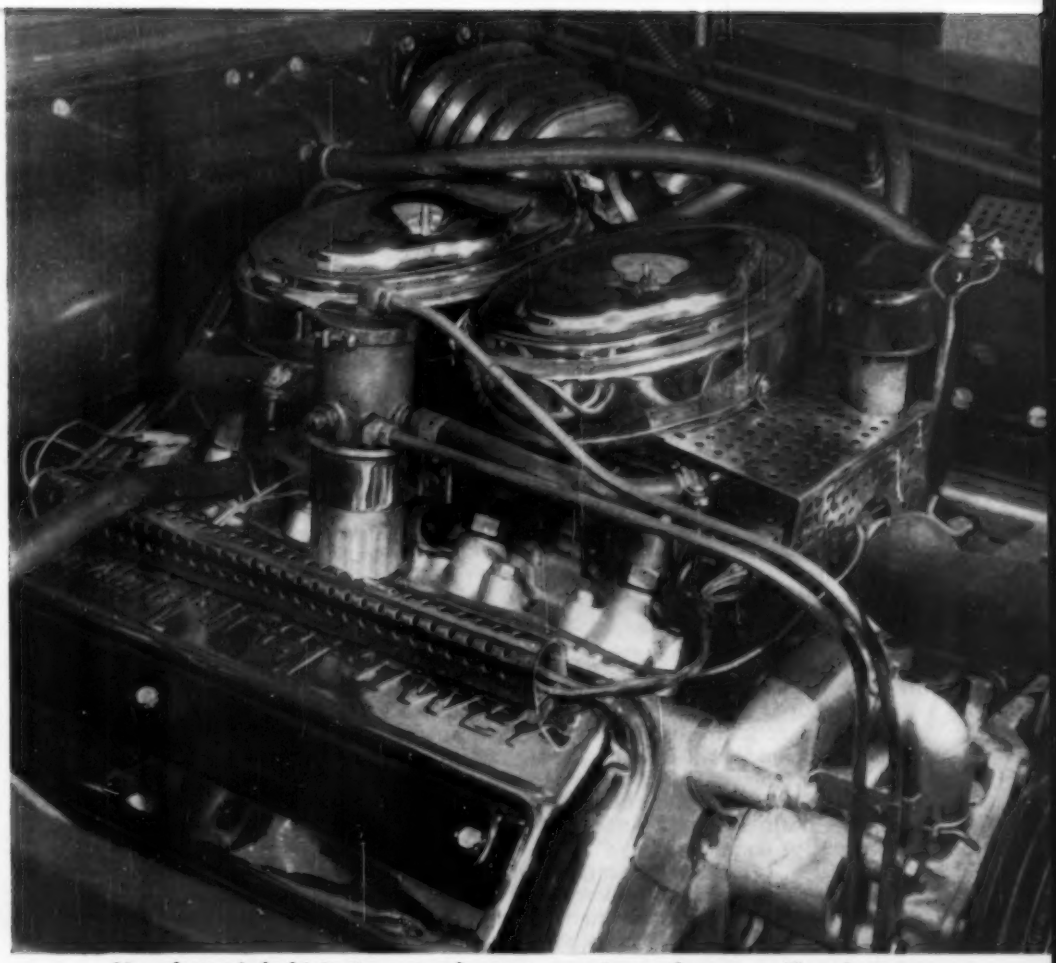
THAT department in the Chrysler Corp. known awesomely as "Central Engineering" was startled and puzzled a few months ago when it was asked to design a carburetor air cleaner without an air silencer. This simply wasn't done. *Everybody* used air silencers. How come no silencer? asked Central Engineering.

The answer emerges with the introduction of the Chrysler 300D, fourth annual version of the corporation's "bomb."

Bob Rodgers, Chrysler Division's chief engineer and originator of the "300" idea, wanted his customers to hear as well as feel the car's power. The result is music. At hard throttle, the in-going air is a baby tornado, yet at cruise only a whisper. To bracket his power package with sound, Rodgers removed some of the muffler baffles. Result: an authoritative mutter at the tailpipe.

At $5,108 factory retail, including federal excise tax and dealer handling (compared with $4,759 for a two-door hardtop Imperial), the "300" is up five notches in horsepower from 375 to 380. That's with carburetors. Add 10 more for the Bendix fuel injection (PS, Mar. '57).

Like any "personalized" car, the "300" has become a product of its owners' desires. When it was first introduced, Chrysler assumed that it would be bought by men in berets and sports jackets. But perfectly conservative businessmen bought it to drive something a little different.



New electronic fuel-injection system boosts power, gives performance without long warmup.

They wanted such things as air conditioning, limited-slip differentials and automatic boxes. And they got them.

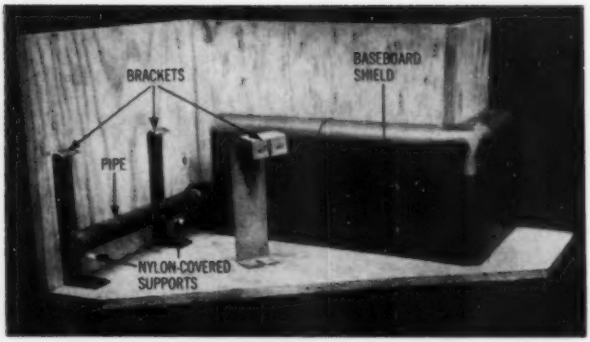
Like its predecessors, the 300D is a bit rough at idle. That's due to exhaust-gas dilution of the incoming gas-air charge at low engine speeds, and *that's* caused by a cam designed for high-speed performance. The ports stay open longer but snap open and shut faster than those in the Imperial or New Yorker. Valve trains are wholly mechanical. That permits engine speeds up to 5,200 r.p.m.—some 400 more than hydraulic lash-compensators, with their tendency to "float" valves, will supply.

Chrysler says the "300" is the fastest and most exclusive U. S. production sedan, and can affidavit both. In 1955 and 1956, the "300" was the National Association for Sports Car Auto Racing (NASCAR) grand national champion. In 1955, it was named the American Automobile Association's champion stock car. In 1957 it did not compete officially, but at NASCAR's annual speed carnival in Daytona Beach it turned in the fastest flying mile for stock cars (135 m.p.h.) and the fastest average speed for a mile from a standing start (86.8).

Less than 5,000 of the cars had been sold when the third year's production was closed out in 1957 and manufacture of the "D" series started. If 1,800 are sold in 1958, it will beat any of the previous years.—*Devon Francis.*

From the labs...

Hot-Water Heat



"Radiant ribbon" is just a pipe

PLAIN PIPE—¾-inch black steel—takes the place of expensive radiators or baseboard convectors in new home-heating plant now being tested. Pipe is installed at baseboard level on supports that also grip a sheet-metal cover. Hot water in the pipe radiates heat to the cover, which then re-radiates it to warm the room.

A RADICAL new development promises to put the hot-water furnace —long a favorite for its even comfort—back into thousands of U. S. homes. It should cut hot-water installation costs in half, and give forced-warm-air heating, now the choice of three out of four homebuilders, a run for its money.

The new system is remarkably simple, and completely eliminates both radiators and conventional baseboard convectors. Instead, the hot water is pumped through a simple loop of plain ¾-inch black steel pipe running around the house.

First tests indicate that the whole system—pipe loop, boiler and controls—can be put in a five- or six-room one-story house for about $400 to $450. Two men do the job in eight hours or less. (This is for new construction; it will of course take longer in an existing house.) Total first cost for conventional hot-water heat today, for a comparable house, runs from $800 to $900. Most of the savings with the new system come from the reduced materials cost and labor of putting heat-distributing equipment in each room.

Why hot water? Mainly, because many people prefer it. The postwar swing to warm-air heating was largely the result of its sharply lower first cost. Before World War II, hot-water systems held half the market. Either type, if soundly designed and correctly installed, gives approximately equal comfort and operating economy.

The new system is called "radiant ribbon." It can be used in new or old houses, or in a new addition to an old house (provided you already have hot-water heat). It is an industry-wide development, but is still experimental.

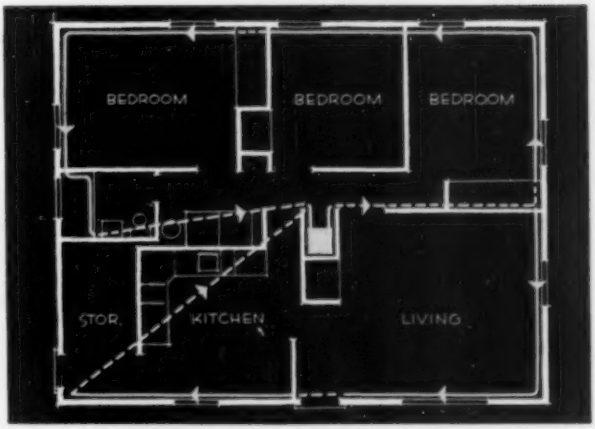
How it works. The change is in the method of distributing heat to rooms. You still use a regular hot-water heating boiler (any make), circulating pump and controls. The pipe loop goes at baseboard level along the outside walls. A thin sheet-metal cover about six inches high covers it.

In operation, water up to 240 degrees is pumped through the pipe loop, and heat is radiated from pipe to shield to room. The loop is a closed circuit with the water under slight pressure so it will not steam. In the few tests made so far, the new system has performed very well.

On a four-below-zero day in a Chicago test house, for example, the crucial temperature spread between floor and ceiling was three degrees—72 at the ceiling, 69 at the floor. That's pretty good. You don't begin to feel cold until the floor is more than about five degrees cooler than the ceiling.

Why it works so well. Although researchers are still not absolutely sure,

Without Radiators



Simple system may halve cost

LOOP OF PIPE around outside walls comfortably heats small one-story houses, trials indicate. Standard boiler supplies 240° water through feeder lines under floor (dash lines). Floor plan at right shows actual setup in full-scale test model of a prefabricated home. Installation of entire heating plant becomes a one-day job for two men.

two main reasons are offered by radiant ribbon's inventor, soft-spoken Edwin Tidd, one-time steam fitter who is now chief of field research for Bell & Gossett, the heating-control firm.

First, Tidd explains, most of the heat it supplies to a room is radiant heat, the best for comfort. Most current hot-water heat operates by convection—room air passing over the heating element is warmed and passes on and up, carrying the heat it has absorbed. Radiant heat, like warmth from the sun, is more direct and satisfying.

Second, the baseboard pipe strikes directly at the two main sources of cold and drafts: the exterior walls and the floor. Heat from the pipe warms up the walls behind it and the floor below it. There is no heat loss from your body to these normally cool surfaces, thus no drafts, chills or goose pimples.

Drawbacks. Before the new system can be approved for houses, a thorny rating problem must be licked. Tidd explains that according to present-day engineering tables, black steel pipe, though the best radiator among pipes, is just not rated high enough for house heating. With 240-degree water, for example, the tables say that ¾-inch black steel will radiate only 131 heating units an hour per foot of pipe. According to the book, you need at least 200 to 300 units for adequate heating.

In practice, however, the system evidently does this or better. Either the tables are too conservative or some unknown factor is at work.

Any other limitations? Apparently no serious ones. Engineers check off these points:

- Safety? The metal shield over the pipe does get as hot as 160 degrees, but standard radiators often run hotter.
- Operating costs? Tests are still incomplete, but indicate that fuel expense will be no more than that of conventional systems, perhaps less.
- How about poorly insulated houses? One solution: Combine the pipe loop with a few conventional finned units, installed where you need a concentrated dose of heat.

The system sounds so simple that skeptics still do not believe it works. It not only does work, but there are now about 20 test installations operating in houses around the country. Two are in National Homes Corp. test houses at Lafayette, Ind. NHC, biggest U. S. prefab house manufacturer, hopes to use radiant ribbon in its future houses. But it may be a year or more before all test data are gathered and analyzed, and the system is officially put on the market.—*A. M. Watkins.*

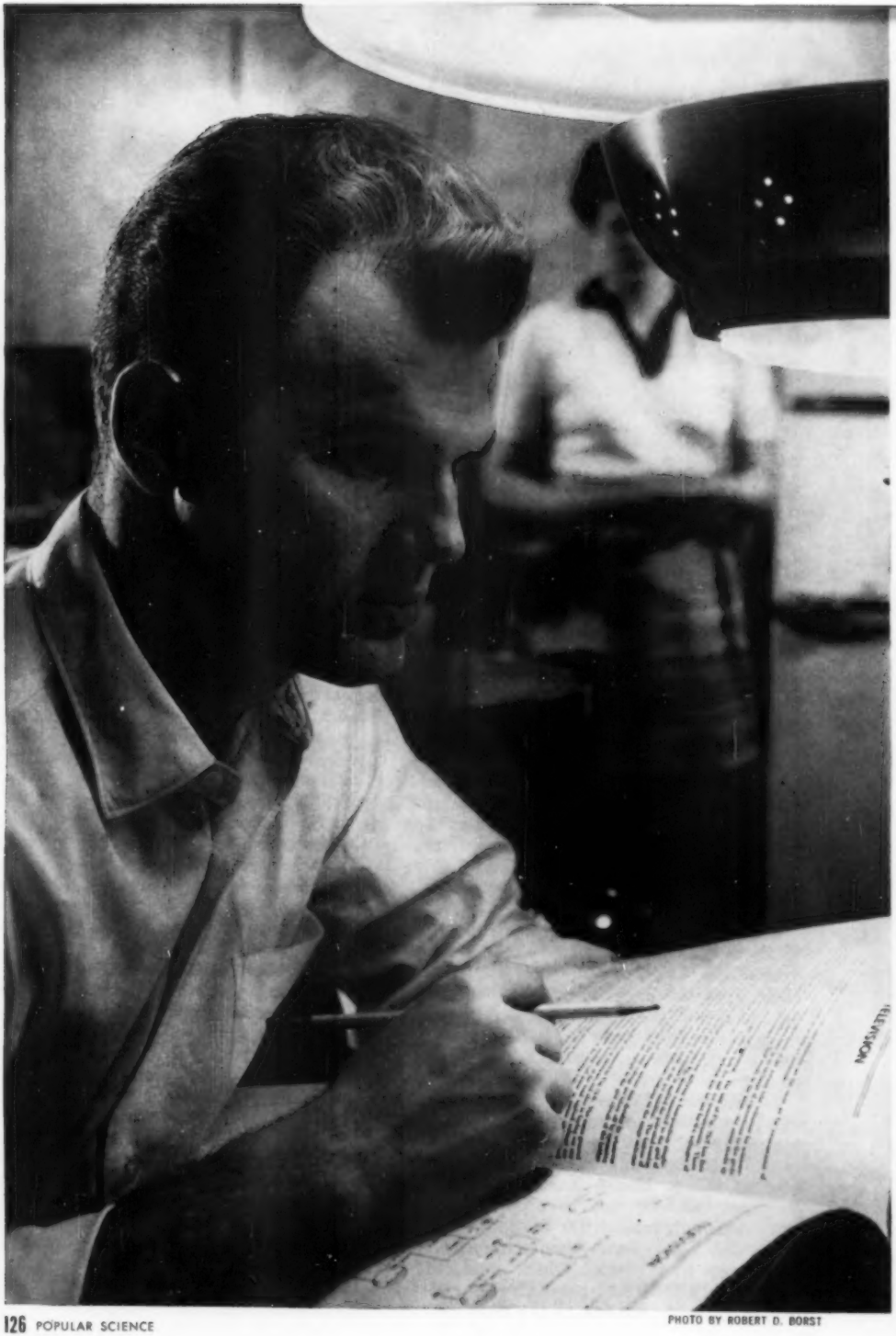


PHOTO BY ROBERT D. BORST

Plain Facts About Correspondence Schools

By Martin Mann

Studying at home to get ahead is a grand old American tradition. Will it work for you? Here's what you should know before you mail the coupon for a course

Part 1: What Are They Like?

JUST reading the newspapers, post-Sputnik, you can spot the big opportunities coming up. As America's all-out effort to beat the Russians gets into high gear, there will be promotions and new jobs in all fields of science and engineering, in drafting, electronics and aviation, in the building, machinework and chemical trades. They'll go to men with specialized training.

You'll want to cash in on these opportunities. But most likely you have a family to feed. You can't quit your job to get additional training. Then how about correspondence schools? Can you get ahead by studying at home?

Last year 1,200,000 people were doing it. They were upgrading their skills or learning new trades from schools they never visited and teachers they never saw. The big majority of them were like the big majority of POPULAR SCIENCE readers: young married men working at jobs that go with higher-than-average skills.

How does it work out? Should you, too, try a study-at-home course? It's a serious decision to make: a chance for success on the one hand, the expenditure of real money and a lot of spare time on the other hand.

POPULAR SCIENCE took a hard look at correspondence schools for you. We mailed in the coupons you would be asked to mail. We visited some schools. We interviewed businessmen and educators. What we found is revealing.

Study by mail is a big, complex and fascinating business, deeply rooted in the American get-ahead tradition. Both International Correspondence Schools and the University of Chicago Extension School started in 1891, the American School in 1897. La Salle Extension University this year celebrates its 50th anniversary.

Which kind of correspondence school? If you take the name to cover every institution that dispenses education through the U. S. mails, there are three main groups. It pays to know how they differ —and why.

- Private correspondence schools—such as ICS, National Radio, Commercial Trades—are set up specifically to sell educational services by mail.
- University-extension correspondence schools are operated by about 150 regular

NEXT MONTH, Part II: What Can They Do for You?

The correspondence schools' promise is plain: advancement in your job—or a better, higher-paying job. Do they deliver? For the answer, Popular Science asked thousands of ex-students: Did your mail-order study help you get ahead? You'll find the results of this firsthand report in PS for March.

colleges, mostly as divisions of state universities.

• Organizational schools are run by the armed services (PS, Jan.), large corporations, trade associations and churches. (Courses in religion, incidentally, are also offered by the private correspondence schools.)

One group of study-at-home organizations—guided-reading institutes such as Alexander Hamilton Institute—differs from the others in an important way. They provide books and instructional material, but no examinations. The student does *not* send his work back for grading, but as he goes along in the course he can ask for consultation and assistance.

All three groups have their uses. It's particularly the university and private correspondence schools, though, that cater to your ambition to invest off-the-job time in getting ahead *at* your job. Their courses are much alike.

The universities, naturally, lean heavily on standard college fare. Languages are by far their most popular courses, but the list of offerings covers all fields.

We will concentrate on the private schools because they offer the university subjects and many, many more. Most popular are the upper-level skilled trades—radio-TV, air conditioning, drafting and the like.

The private schools are also the biggest; they appeal to more career-minded men than any other group. Excluding those in the armed services' program, the vast majority of correspondence students—better than 80 percent—are enrolled in the private schools. How do they operate? Here's what happens after you send in that coupon.

Signing up. Your coupon inquiry will bring back by mail a sample lesson and some inspirational literature. It's designed (a) to find out roughly what kind of person you are, and (b) to convince you that you should sign up for a course.

Will a salesman call on you? Could be. Fewer than a fifth of the schools send out salesmen—but these include some of the largest schools: specifically, the oldest, biggest and best known, ICS.

The better schools now choose a salesman—he's called a field representative or, simply, a rep—to be like the ideal life-insurance salesman. They look for a stable, respected member of your community, a friendly source of expert counsel. His commissions depend on keeping you studying, so he's not much interested in selling you a course you'll drop. In some cases, he is specially trained to serve as a guidance counselor.

The rep will telephone your wife to set a time when he can talk to you both. Her cooperation is essential because you will be studying at times when otherwise you might help her with the kids or take her to the movies.

Enrollment. Whether the approach comes in person or by mail, the schools try to guide you into a course that

Lesson Questions

Be sure to number your Answer Sheet 3B.

Place your Student Number on *every* Answer Sheet.

Most students want to know their grade as soon as possible, so they mail their set of answers immediately. Others, knowing they will finish the next lesson within a few days, send in two sets of answers at a time. Either practice is acceptable to us. However, don't hold your answers too long; you may lose them. Don't hold answers to send in more than two sets at a time, or you may run out of lessons before new ones can reach you.

1. If a pulsating dc voltage which varies from 15 volts to 1 volt has a dc component of 8 volts, what is the peak value of the ac component?
2. What instrument is usually used by technicians to measure resistance?
3. Name the *two* types of resistors commonly used in electronic equipment.
4. If the current flowing in a circuit is 100 mils when the voltage is 50 volts, what will the current be if the voltage is reduced to 25 volts?
5. Draw a schematic diagram of a circuit showing a battery with 3 resistors connected in parallel across it.
6. What will the current be in a circuit where the voltage is 100 volts and the resistance 100 ohms?
7. Give the three forms of Ohm's Law.
8. In the circuit shown, the sum of the voltage drops across resistors R1, R2, and R3 will be (1) equal to, (2) more than, (3) less than, 100 volts.

EXAMS ARE NO SNAP: One comes with every lesson, usually looks like this (above). It was taken from an early lesson in

at a fraction of the cost of going away to regular college

will prove useful and within your scope.

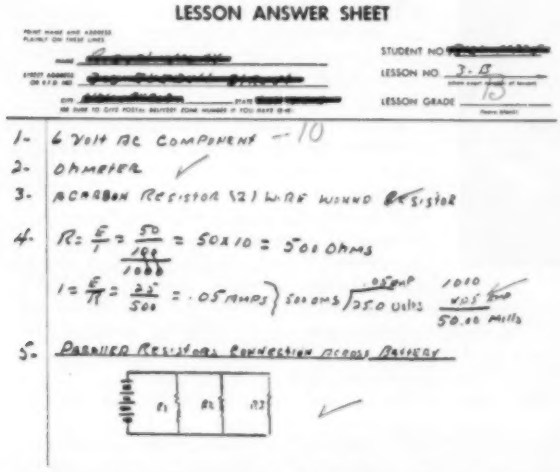
A very few private schools insist that you have a high-school diploma (55 percent of correspondence students do). But most have no set requirements for previous education. Their basic tenet is that they can train almost anybody. In general, they have made good on this claim. The first few lessons in all courses are elementary. In technical subjects, for instance, beginning lessons review high-school math.

We pursued this point with some correspondence-school administrators. Suppose a man whose mathematical ability is limited to fourth-grade arithmetic wants to take a course in engineering or accounting? The usual strategy: Try to steer him into something simpler.

Some schools—particularly those specializing in art and writing—flatly refuse to accept students who obviously lack natural talent. But this attitude is rare. So don't overestimate your own capacity. Be realistic at the start.

The contract. The ones we examined (from large and reputable schools) were simple, understandable documents—no fine print, no legal gobbledygook. But they *are* contracts, just as binding on you as the installment paper you sign when you buy a car or a house.

One says bluntly that cancellation is not permitted—once signed up you are committed. Others permit cancellation, but still require payment of a sizable part of the total fee.


LESSON ANSWER SHEET

STUDENT NO. [redacted]

LESSON NO. 3-B

LESSON GRADE 10

1- 6 Volt AC Component — 10

2- Ohmeter

3- A Carbon Resistor (2) Wire Wound Resistor

4- $R = \frac{E}{I} = \frac{50}{\frac{100}{1000}} = 50 \times 10 = 500$ Ohms

$I = \frac{E}{R} = \frac{25}{500} = .05$ Amps } 500 Ohms } .05 Amp 25.0 Volts 1000 × .05 Amp 50.00 Mills

5- Parallel Resistors Connection Across Battery

a TV course. Actual answer sheet from a Louisiana student is at right. He flubbed the first problem, but ended up with a B.

The cost, naturally, varies directly with the number of lessons. A course that takes a year or two —TV repair or a "unit" of engineering, for instance—runs from $200 to $300. The complete four-to-eight-year engineering course, preparing you to take the state exam for a professional engineer's license, would come to $1,000. By contrast, the average cost of attending a regular college is $1,600—*for one year.*

The fees generally cover everything—books, tools, instruments, experimental equipment. And you pay on the installment plan, as you study.

The lessons. They're really booklets, some running to 100 pages with full-color illustrations. Most are not so elaborate, though.

The writing is straightforward, the subject matter simply and logically developed. The schools' claim—that if you can read English, you can follow the lessons—seems well founded. Up-to-dateness varies; in general it's good. A text on portable radios, for example, covers transistor models.

The fetish of simplicity has its drawbacks. Take the case of an elementary lesson on one-cylinder gas engines (from a school that could *not* be considered among the best). After looking it over, one PS editor commented: "This is all right in a dogged sort of way. But the method leaves it up to the student himself to get beyond his own sticking points;

[*Continued on page 278*]

The Building One Man Can Carry

By George Laycock

LIGHT enough to tote on one shoulder, the bundle shown above can be ballooned into a weathertight and durable building measuring 40 by 80 feet. Paper-thin, vinyl-treated nylon does the trick. Inflated to mushroom shape with hardly more air pressure than you'd find in a soap bubble, it produces one of architecture's weirdest, yet up-and-coming structures—the "airhouse."

Today our armed forces and industry alike are finding a multitude of uses for these easily set up, highly mobile shelters—all based on a pilot model developed by the Cornell Aeronautical Laboratory in 1948. They're serving as radar shelters in the Arctic. They're being used as storage sheds by chemical, petroleum and steel companies. And according to John Whisman of the Irving Air Chute Company—a leading manufacturer of airhouses—the time will come when you'll watch outdoor movies and baseball and football games beneath huge protective domes of nylon. He also foresees a day when standard family camping equipment will include an air-supported tent, inflated with a tiny, battery-powered blower.

The big attraction of the airhouse to industry is its low cost. With the price of lumber, steel and masonry still going up, conventional structures for storage are expensive. But a 38-foot, hemispherical airhouse costs only about $1,600, including a blower.

There are other factors favoring the airhouse. It can be set up by unskilled labor. A crew of four men without training can erect a 40-by-80-foot model in four hours. Airhouses need no floors, and no special footings or other supports. If it's advisable to relocate them, you simply shut off their blowers, let them collapse, and carry them to the new site. They can even be placed on sloping ground, for they follow the contour of the land and form their own seals.

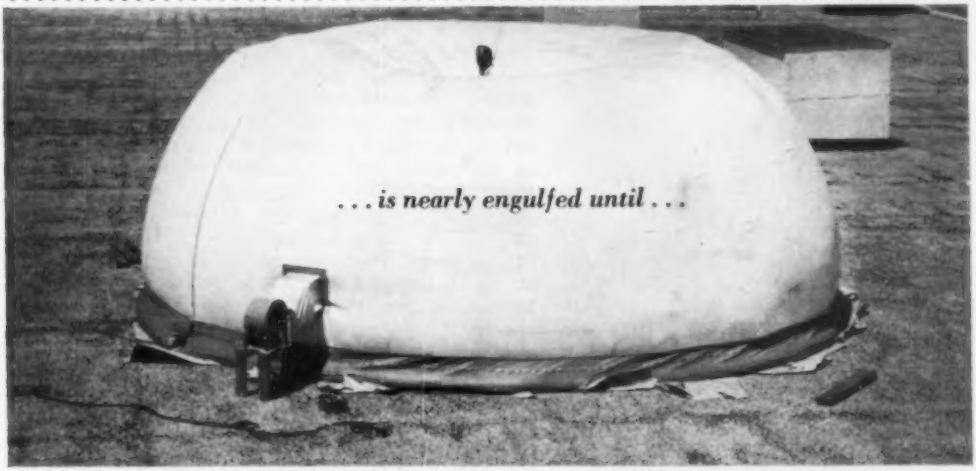
To erect an airhouse you simply stretch it out, fasten the bottom down with sandbags or metal strips and turn on the blower. Within a matter of minutes the building has expanded to full size.

The squirrel-cage-type blowers used for airhouses are usually nine inches in diameter and seven inches across. They're powered by ⅓-hp. motors. These run constantly to keep the structure erect, drawing about as much current as a 300-watt light bulb. Once the house is inflated, the blower recirculates the air within it, preventing any further build-up of pressure. This pressure, incidentally, is only slightly greater than that of the atmosphere outside.

This is one house where you don't dare leave the door open very long. But to prevent leakage, the doors need be nothing more than flaps that are sealed with zippers. More elaborate airhouses have either revolving doors or double doors with an air lock between them.

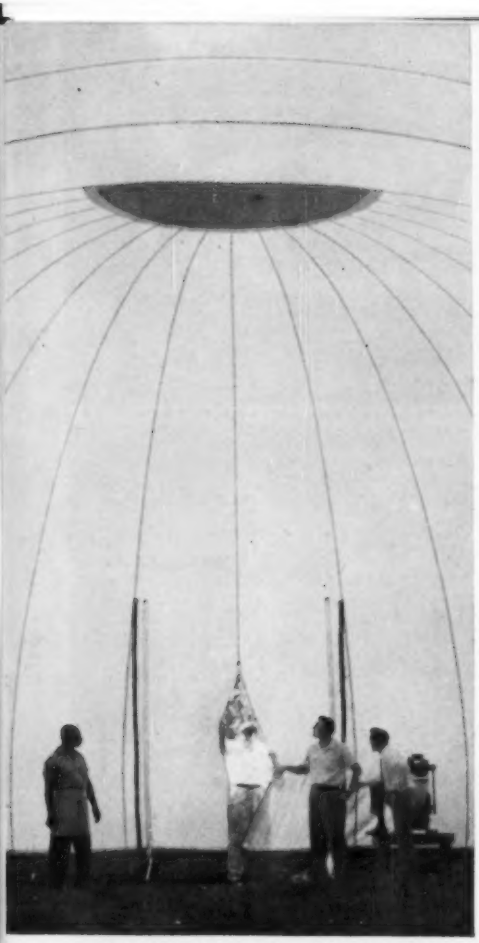
They're rugged. Already the users of airhouses have learned that hazards to

Man on a deflated airhouse . . .



. . . is nearly engulfed until . . .

. . . full pressure carries him aloft!



SIMPLE DOOR of this nylon igloo is a zippered flap that seals in air used for inflation.

DOUBLE DOORS with air lock between them let fork trucks enter this storage airhouse.

the strange-looking structures are fewer than they once imagined. A boy with a BB gun can't make a hole in the tough plastic. Even if he could, the tiny hole wouldn't deflate the house. Hail stones—even the largest ones—bounce off the material without injuring it. Heavy ice and snow are cleaned off by the shifting air pressure below. The added weight makes the fabric roll and bounce, and the load loosens up and slides off to the ground.

These inflated houses are so tough that workmen can lean ladders against them and walk around on top if necessary. They can even stand on them while they go up. When it comes to taking high winds, airhouses are better than many standard-type buildings. In the Arctic, where the armed forces have had plenty of experience with them, they've withstood blasts of 150 miles an hour.

Even an electric-power failure can cause little damage. The house simply settles down over the materials inside it. When the blower starts again, it balloons back into position. Should the fabric rip, it can quickly be repaired with a patching kit supplied by the manufacturer. This kit contains strips of the same material used for the house, along with cement and a brush.

One of the big problems still facing builders of airhouses is heating and air conditioning. This is still costly, as the thin nylon has poor insulative properties. On the other hand, air conditioners have been used successfully to keep some airhouses inflated.

Home builders are beginning to use airhouses to cover buildings under construction. With such weatherproofing, they can now work during the bad months that formerly brought building to a standstill. They can even purchase an expandable airhouse. As construction progresses, the airhouse covering it grows, too. It's this easy—you just zipper an extra section onto it.

Life expectancy of an airhouse is about seven years. It takes that long for ultraviolet rays to break down the vinyl coating on the fabric. But chemical laboratories are working on this problem, and the chances are good that airhouses of the future will last longer, further increasing the number of useful purposes they serve. END

How the Auto Makers Spy on Each Other

By James Jones

NOWHERE is commercial spying practiced more assiduously today than in the auto industry. With billions of dollars in sales riding on the public's whims, and with as much as three years' lead time needed to ready a new model, an auto maker must know quickly and accurately what nasty surprises his competitor is brewing.

If Ford plans to move the transmission back to the rear-axle area in 1960, as some spies say, thereby eliminating the

tunnel bulge, Chrysler wants to know how it's done. If Chrysler plans unitized bodies, as some spies hint, Ford wants to know how they differ from those on the 1958 Lincoln. If GM is engineering cantilever roofs, as some spies insinuate, everybody wants to know how and when. Hence, industrial espionage—and plenty of it.

Detroit intelligence agents achieve extraordinary success. Details of the 1958 models now on the road were known to all auto makers before mid-1956, in some instances before 1955.

Last July, Jack W. Minor, the Plymouth sales V-P, addressed 2,200 dealers. He showed them photos of all the 1958 cars—except Chrysler Corporation's. Idea: Let salesmen see what they'd be up against in the 1958 sales struggle. By then every other auto maker knew exactly what Chrysler cars looked like, and what engineering features they did and didn't possess.

"You concede that the competition is aware of your plans a year in advance," says C. Torrey Adams, the ex-FBI agent who directs Ford Styling Center security. Even the best protective screens break down by then because so many people have been cut in on the hot scoop.

The critical period is 18 to 48 months ahead of production. An auto maker who can steal a competitor's idea that early picks up a trump card. He has time (a) to apply the idea to his own products, or (b) to counter the idea.

Keys and locks to styling offices, made in the plant, can be changed in an hour

"If I aim a punch at a guy's head," says Adams, "he can get set to block it. That applies here. If one company knows what another has coming, it can set up advertising and sales-promotion arguments in advance to counterattack."

The angles are many and devious. Take The Case of the Spinner Grille, a classic of auto espionage. Ford stylist George Walker designed a spinner—an airplane propeller-hub sort of thing—into the 1949 Ford. Then his agents turned up a photo of the 1949 Pontiac, also with a spinner in the grille. This was nine months ahead of Pontiac's introduction date.

Considering Detroit's knee-in-the-groin tradition, Walker could have smiled and kept his mouth shut. Ford was coming out first. Pontiac would have looked foolish presenting an apparent copy of a Ford design.

Walker, however, working on the theory that it's okay to maim the competition but not to kill them, boldly broke the news to GM's styling chief. It cost Pontiac a fortune to crash-program a new grille.

When Walker became Ford's vice president and director of styling, he ordered Adams to cinch up the security web. Adams began by reducing the number of people allowed to see advance models. Some 2,000 employees were then authorized to visit Styling; now it's 300.

"We're trying constantly to reduce the number of exposures to new models," says Adams. "That way, you make information less clear and you slow down transmission."

Adams took other semi-military steps:

A badge system limits the movement of authorized visitors. Color codes bar visitors from sensitive areas.

The $11.5-million Ford Styling Center sits far back from main thoroughfares. Guards watch every visitor, wherever he goes. They even man a roof-top spotting scope to scan surrounding areas.

All keys are cut and all locks assembled right in the Center. Every lock could be changed in less than an hour. Waste-

baskets have locked lids. Their contents are burned at Ford's power station by guards. Obsolete mockups are crushed by bulldozers.

About the only place left from which spying can be done is overhead. Adams is studying baffles to screen the patio where mockups are viewed in natural light. "Even if nobody [in a plane or helicopter] is taking pictures," says one official, "you never can feel sure that they aren't."

The crudest spying techniques sometimes work. Take the Pontiac stylists who wanted a preview peak at the new Lincoln—in the sheet-metal, not just in photos. Carrying rolls of blueprints, they marched boldly through a side door of the Lincoln plant posing as Lincoln employees, and casually strolled down the assembly line.

Unfortunately, a Lincoln supervisor had once worked for the Pontiac men. They saw each other at the same time. The Pontiac interlopers wanted no truck with their ex-colleague—not while trespassing, anyway—but he ran after them to say hello. What followed looked like a Laurel and Hardy movie. The Pontiac stylists dodged around the assembly line, backtracked, and dived through strange doors before escaping.

One of the main loopholes in security is people. They talk. To lock loose lips, Adams runs a persistent educational program. Everyone is taught that leaked data can easily hurt Ford—and the jobs of Ford people.

"Some of the greatest leaks, I'm afraid, come from the top," said one Big Three official. "The brass will be gathered at the Detroit Athletic Club or Bloomfield Hills Country Club, at a party or in a locker room, and accidentally let fly with some secret of more than passing importance."

Sometimes a slip of the tongue tips off more than the boys in the locker room. During a press preview of Chrysler's 1954 cars, Chrysler president L. L. Colbert was asked if the corporation planned a sports car. Colbert said no, then added: "I suppose all you fellows know that Ford is going to build 15,000 sports cars next year."

The fellows didn't know, but sure enough, along came the Thunderbird.

Even security-wise engineers get mousetrapped. It happened to George Huebner, chief of Chrysler's automotive gas-turbine project.

Priceless secrets of futuristic models die with the mockup—crushed by a bulldozer

He was test-driving the still-secret turbine in an innocent-looking 1954 Plymouth. One evening he took the car home. His young son David badgered him for a ride. Huebner agreed. And how about the kid next door? Okay.

But when they stopped for the neighbor's boy, waiting there, too, was the neighbor himself—a well-placed executive in a competing company. He got in, knowingly eyed the elaborate instrumentation and went for a ride. "What could I do?" says Huebner.

All auto makers deny that they pirate competitors' employees to pump them, but it's public knowledge that stylists and engineers are as mobile as the Detroit Red Wings hockey team.

On the one hand, a company man states, "We would not hire a man who came to us with competitive data to sell. He might leave us in a few months and go somewhere else to sell."

On the other hand, an ex-Chrysler

stylist revealed that he devoted his first two months on a new job to sketching what he could remember of "Forward Look" designs for the future.

Another rich lode thoroughly picked over by spies is the Rackham Building, headquarters of the Engineering Society of Detroit and meeting place for the Society of Automotive Engineers and other professional groups. An intelligence operative, armed with an expense account and membership in one society or the other, can cement friendships with any number of engineers. Over a casual after-meeting beer, any number of tidbits can be netted.

Conventions of machine-tool builders, glass manufacturers and other automotive suppliers are also religiously attended by the snoop-and-poop forces. They meander from one hotel hospitality suite to another, sipping neighborly drinks, making small talk—and getting the lowdown on what the competition is working on.

Detroit's many small tool-and-die shops are a milk-run for the agents. Says one spy: "We had the word almost immediately last year when GM kicked off a crash program to revise some of its '58s. Every die shop in town suddenly filled up."

Spy headquarters (called "competitive data" or "advanced product planning" offices) are hidden in the engineering department or the industrial-relations section, out of which security forces operate. Here is where the real pros spend every working hour compiling, discarding and interpreting news of the opposition's plans.

Contrary to common belief, these agents are all known to one another. Within limits, they freely exchange knowledge.

Much of the work consists of telephone calls between competing spies, who ask outright about future cars. One rule remains inviolate: The spy never goes directly to the competitor about whom he wishes to inquire, and he never talks about his own company's future products. But he'll spill all he knows about anybody else's dream stuff. Thus, a conversation between a Studebaker-Packard agent and a Chrysler spy might go this way:

S-P: "Did you know that Buick has frozen the design of that new transmission we were talking about?"

Chrysler: "No, I didn't. Very interesting."

S-P (tactfully): "By the way, can you tell me whether Mercury has discarded the spare tire for '59?"

The Chrysler man may know—and tell. At the same time this discussion is going on, Ford and another Chrysler agent may be exchanging dope about Pontiac and Rambler. Information has been traded; quid pro quo has been maintained—and "secrets" flow as steadily as Chevys off an assembly line.

How does a spy get in the business? One described it this way:

He had been working as an engineer in a nonautomotive division of his company. He was given a temporary job in an auto division (to test his engineering qualifications). Then he was invited to join the espionage staff. He hadn't any notion of where a spy even begins to spy.

Shortly, he was invited to lunch with two engineers from two other companies. Conversation was casual, seldom touched on business. Soon after, though, one of his luncheon companions phoned to ask if he, perchance, knew that XYZ Corp. planned a clear-plastic roof insert for 1960. No, he didn't. Before the conversation ended, his caller discreetly inquired about a suspension under development at yet another company. The files he had inherited produced the information.

Then he began receiving envelopes bearing no return addresses, but containing pictures and specifications of competing cars. Who sent them? The guy who telephoned next day for information about a different competitor. That's who. Our hero was in business.

Within a few months, his files of secrets bulged like John Foster Dulles' briefcase. (If this revelation of bold, bald blabbering is disappointing and deglamorizing, we're sorry.)

Why spy? Sure, information is traded—but never about the trader's own company. The massive intelligence effort is worthwhile because of the billion-dollar stakes the industry gambles every year. There's always the hope that you can play your own hand close to your chest—but divine what cards the other guy holds. **END**

What Science Is Learning About Headaches

There's no simple solution to this age-old curse, but now research has turned up some good advice for chronic throbbers

By Milton Silverman

RECURRING, chronic headaches today afflict nearly 20 million victims in the United States.

They represent a major cause of absenteeism in American industry, hitting hardest the intellectually superior workers.

They mark a major mystery to doctors, and have caused one physician to remark, "If I wished to show a student the difficulties of medical practice, I'd give him a headache to treat." They are enigmas.

And to Western civilization, they serve as the most impregnable of all social excuses, enabling millions of men, women and children to avoid unappetizing parties, committee meetings, delicate family conferences, and even homework.

Who gets headaches? Last summer, at the annual convention of the American Medical Association, Dr. Henry Ogden of Louisiana State University revealed that these painful attacks seem to follow

a strange but suggestive pattern. On the basis of a study of 4,634 subjects, he found that headaches—including the common, non-chronic variety—were reported by about 60 percent of the general population: 71 percent of the women and 51 percent of the men. They were strikingly more common among the young rather than the old, among the single rather than the married, among the educated rather than the unlearned, and among executives and professionals rather than salesmen, manual workers and farmers.

"It is obvious," one medical observer declared, "that the best treatment for headache is to be an unschooled, happily married farmer aged 80 or 90. Unfortunately, this is a treatment which I can only rarely prescribe for my patients."

To the host of patients who suffer constantly from headache, and to their friends and relatives who suffer with them, the most desirable prescription would be a pill, an injection or a surgical operation that would end the ailment once and for all. In spite of thousands of years of study, except for a few special conditions, medicine has turned up no such simple answer. Medical men have investigated headache by using professional head-standers, putting human volunteers into giant centrifuges, dosing them with hundreds of possible headache-producing chemicals, pulling and probing exposed brain tissues in conscious patients undergoing brain surgery, and injecting gases and liquids to build up pressure inside the skull. But even after all this research, doctors are not completely agreed on the machinery involved in the most common varieties of headache.

What causes that throbbing? Contrary to a widely held belief, most headaches are not caused merely by increased pressure in the head. The cranium can stand remarkably high internal pressures without producing symptoms. Probably the most important mechanisms, Dr. H. Houston Merritt of Columbia University stated a few months ago, are distention and swelling of blood vessels within the head, inflammation around the head arteries and nerves, and direct pressure on the nerves in the head and neck. Any one of these alone, or a combination of them, can result in misery.

But what triggers these mechanisms? Where should we search for their cause?

If there is any agreement in this hotly controversial field, it is that most headaches have no single or simple cause. A headache is not a disease in itself, but—like fever—is a symptom of disease.

During the past few years, medical researchers have come closer to an understanding of the basic ailments that may hide behind a headache. In more than 90 percent of all cases, headaches are *not* connected with brain tumor, brain infection, hardening of the brain arteries, trouble in the eyes, nose, sinuses, ears or teeth, a hit on the head, or even the frequently blamed stomach upset.

"Constipation and gastrointestinal disturbances are reputed to be a common cause," said Dr. Merritt, "but their importance has been greatly exaggerated."

This does not mean that all these and other factors may not have some significance. There is ample evidence that eye strain, hunger, sinus infections, overeating, loss of sleep, and overindulgence in alcohol may serve as aggravations. But in most headache patients—at least, in most of those desperate patients who go to a doctor for help—none of these can be indicted as the arch-criminal.

With more than 90 percent of these chronic sufferers it now seems that two major types of disorders are involved. One is the so-called tension headache. The second is the notorious migraine headache. Each has different characteristics, which most patients and nearly all physicians can recognize, and each usually requires different methods of control.

The tension headache is probably the most common of all. It occurs more frequently in women—or, at least, women more often go to their doctors about it. It is only rarely preceded by any warning signs. It hits frequently, and 30 percent of the victims complain of daily headache. The pain usually starts at the back of the head, moves forward and involves both sides, and is described as a combination of burning, pressing and throbbing.

The typical victim says, "It feels as if my head were in a vise."

Sometimes the pain is violent and completely crippling. But at other times, a panel of experts stated recently, there is "a tendency of the patient to exaggerate the extent of the headache, to portray

it in melodramatic terms and to boast of the suffering he is compelled to endure. . . . However, such headaches rarely interfere with work, play or sleep."

Behind these headaches is usually a case of emotional tension—of worry, anxiety, fear or nervous strain. "These are tensions that would normally make a person blow his top," says one psychiatrist. "But the headache patient doesn't blow his top. He bottles up his tensions and gets an ache in his top instead."

Many sufferers are inclined to blame their symptoms on such obvious indiscretions as smoking too many cigarettes. But several investigators claim it is usually some underlying emotional pressure that is causing both the excessive smoking and the headache.

Some victims are inclined to interpret their symptoms as a sign of impending insanity. They may think, "Maybe I'm losing my mind." But there is no particular relationship between headache and insanity; as a matter of fact, patients in mental hospitals have been found to be remarkably free of headaches.

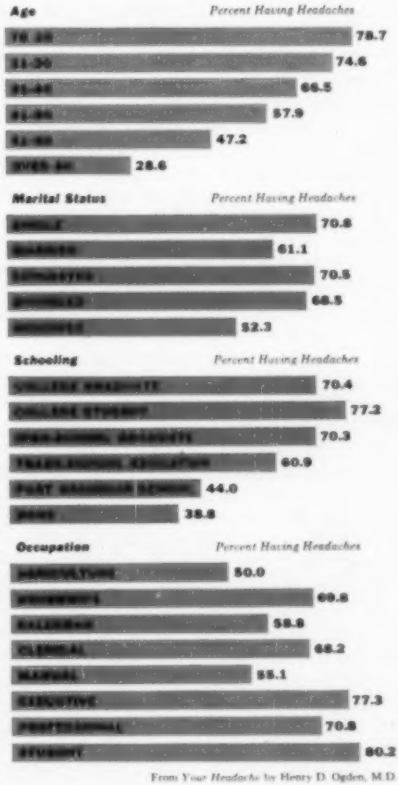
Relax and feel worse? So-called tension headaches sometimes appear just at the time when tension seems to be suddenly released. These involve what some doctors call "relaxation headaches"—the Sunday headache of the businessman, the Monday headache of the preacher, the day-off headache of the nurse, and the post-examination headache of the student.

Once a tension headache starts, the pain can usually be relieved by a pill. In some cases, any pill will work. For example, during a New York study involving more than 5,000 subjects, it was found that placebos—inactive "dummy" pills—reduced the pain in about 55 percent of the victims. More help, however, was obtained from aspirin or some other pain-killing compound, sometimes given in combination with a mild sedative. In the New York study, the best results—71 percent of the patients relieved—were recorded with such an analgesic-sedative combination.

Stopping such tension headaches is one problem. Finding a way to prevent them—to get permanent relief—is even more difficult.

"A person with a headache," claims Dr. Louis Moench of the University of Utah, "may find himself on an excursion

Who gets headaches most? Here's how groups compare



From *Your Headache* by Henry D. Ogden, M.D.

to an ophthalmologist, otolaryngologist, neurologist, dentist, psychiatrist, osteopath and chiropractor. Thereupon, he is X-rayed, massaged, fitted with glasses, relieved of his turbinates and teeth, and too often emerges with his headache intact."

Well-meaning friends—or not-so-well-meaning enemies—may confuse tension headaches with imaginary illness, or accuse the victim of shamming or goldbricking. But, as millions of pain-stricken patients know only too well, and as many of their friends and enemies eventually discover for themselves, there is nothing imaginary about tension headache.

What about tranquilizers? In some instances, the tension can be temporarily

Picture News

relaxed by the regular use of these drugs. One such compound, Miltown, was introduced as a general tranquilizer after a Florida psychiatrist first found that it prevented tension headaches. But the problem is not permanently solved until the patients learn how to live without excessive tension—to solve their marital problems, understand their children and their in-laws, get along with their fellow workers, and learn how to accept themselves and their environment.

One victim of constant tension headaches, for instance, found his pain stopped when he finally admitted to himself that he would never set the world on fire, but nevertheless could have a perfectly satisfying career as a good husband, father and citizen. Another—a hard-driving, energetic young man constantly racing against deadlines—found the answer to his problem by having a serious heart attack.

"It wasn't having the attack, or surviving it, that cured my headaches," he said later. "But afterwards, when I learned to relax and live an easier life to spare my heart, I found my headaches had disappeared."

The migraine headache is the second most common variety. Just as with tension headaches, emotional factors are also believed to play a key role in setting off these attacks. This awesome form was recognized at least 5,000 years ago, and ancient Babylonians attributed it to the activities of a demon named Tsihatho.

While tension headaches most often begin without warning, migraine headaches are usually preceded by one or more ominous signals. A few hours before the pain strikes, some migraine sufferers feel oddly depressed or irritable, while others become suspiciously happy and elated; one patient, for example, recognized this latter warning sign by observing, "I feel dangerously well today." Still others usher in their bouts by dizziness or nausea.

Once the actual headache begins, it is usually limited to one side of the head —the word migraine comes from the Greek *hemi,* for half, and *krania,* for skull—and is almost always described as a throbbing pain.

Migraine occurs much more frequently in women, with approximately five female to every two male victims. In nearly two-thirds of all migraine patients, there is a record of the disease in other members of the family. It has been found in children only 18 months old.

Migraine has been blamed on everything from allergies, nicotine, alcohol, vitamin deficiencies and hormone imbalances to neck strain, eye strain, and constipation. Some of these factors, notably certain allergic reactions, may play a contributory part; but there appears to be no generally accepted evidence to show that any of them plays the major causative role. Instead, according to Dr. Arnold P. Friedman, chief of the famed Headache Clinic at Montefiore Hospital in New York, doctors are now beginning to realize that there is a psychological pattern characteristic of migraine victims.

"In recent years," he told a medical meeting, "studies have indicated that many patients with migraine are meticulous, neat in appearance, rigid in their thinking, and excessively aggressive toward their environment."

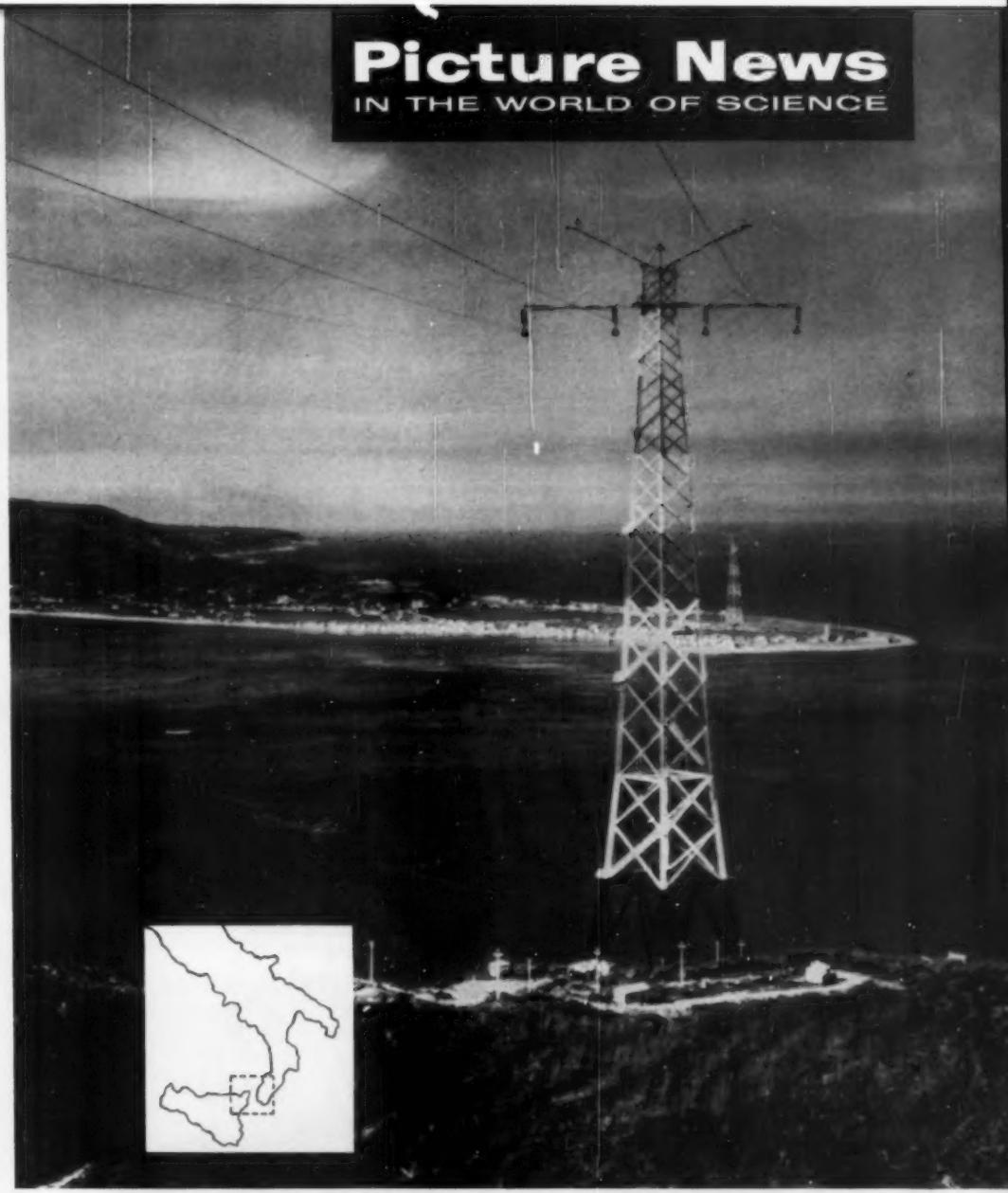
Other workers have described such people as unyielding perfectionists who demand a flawless performance from everybody, especially themselves.

In past years, almost every major specialty in medicine has temporarily adopted migraine as part of its medical domain and reportedly found a "cure" for it. Ophthalmologists have claimed that correcting vision gave relief to more than 90 percent of the victims. Allergists have announced cures or dramatic improvement in 50 to 80 percent of migraine cases by desensitizing the victims, or keeping them away from offending pollens or foods. Bone surgeons have claimed 85-percent success by applying traction to the neck. Endocrinologists have described excellent results with sex-hormone treatments, and internists have noted equal success with injections of vitamins or minerals. Such brilliant but generally unconfirmed assertions have caused some observers to wonder whether the "cured" patients were really migraine victims in the first place.

What stops migraine? Patients with true migraine, when stricken by their aches, are rarely helped by any dummy pills. Ordinary headache remedies give them little relief. For them, the most effective compound appears to be a chemical that has no direct effect on pain

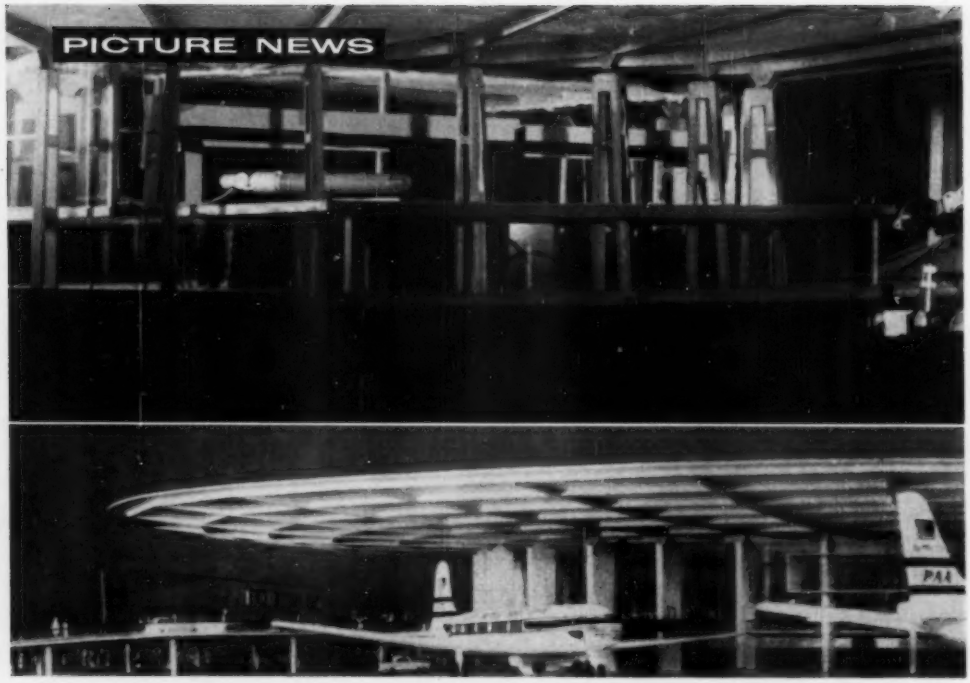
[*Continued on page 236*]

Picture News
IN THE WORLD OF SCIENCE



Giant line carries power across Straits of Messina

STRETCHING between Scylla and Charybdis, rock and whirlpool of Homer's epic, this 220,000-volt power line between Italy's boot and Sicily is an engineering wonder. Built by the Societa Anonima Elettrificazione, its 740-foot towers, 11,985 feet apart, carry steel and aluminum cables dipping to 230 feet above the sea to stand wind and seismic stresses.

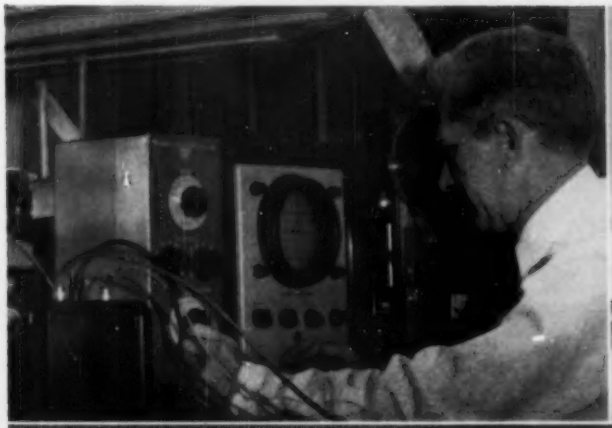


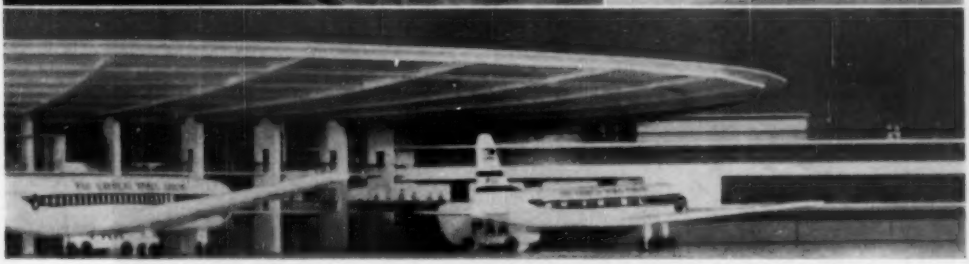
Jet age coming: they're soundproofing an air terminal

How do you spare the people in the waiting room the din of taxiing jets? The answer, in Pan American's new terminal (shown in model above) at the New York International Airport, is soundproofing for the

Mountain moves two miles; becomes roadbed in lake

A TWO-MILE conveyor system (below, left) moves 83,333 tons of gravel a day from a mountain to barges (right) to be used as fill for a 13-mile roadbed for the Southern Pacific across Great Salt Lake. Main belts take loads up to 5,000 tons an hour, travel 850 feet a minute.





underside of the cantilever roof. At top, R. L. Cardinell, member of the acoustical engineering firm of Lewis S. Goodfriend, Montclair, N. J., tests noise recordings in a 1/40 scale model. At right is a sample of two-inch Foamglas developed by Pittsburgh-Corning for use on this jet-age job.

VTOL airliner is both helicopter and plane

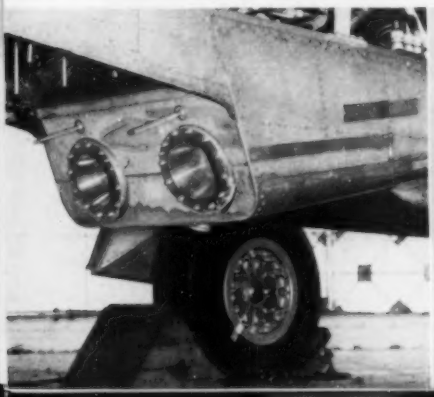
THIS British Fairey Rotodyne takes off and lands vertically like a helicopter and cruises on fixed wings. It runs on two 3,500-hp. forward-driving turboprops that also supply jet power to drive the rotor blades. Top speed is 200 m.p.h., range 400 miles. It carries 48 passengers.

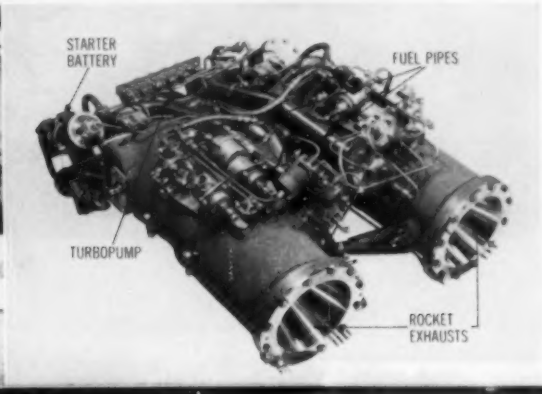
Terminal handles 30 express cars, 53 trucks at once

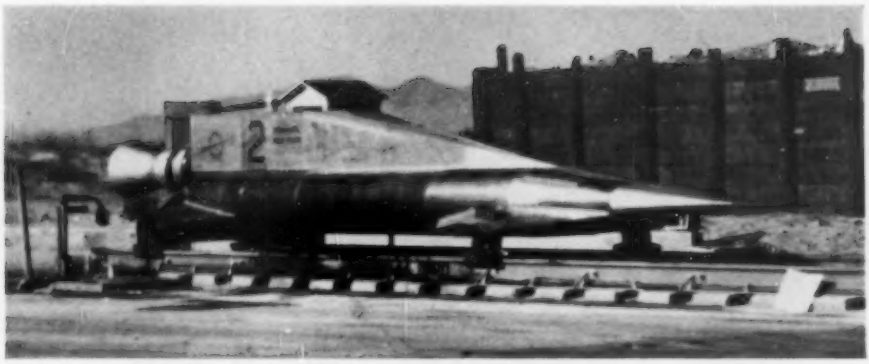
POWER and gravity belts, rollers and moving slats—1,213 feet of them, in all—move 600,000 pieces of express a month at this new Railway Express terminal, across from the New York skyline at Hoboken. In the lower photo, packages are processed simultaneously from trucks and trains. The loading facilities can accommodate 53 trucks and 30 cars.

Twin rocket booster sends bomber to altitude record

A NAPIER Double Scorpion rocket, slung under the fuselage below, enabled a British Canberra to set the bomber altitude record at 70,000 feet. The twin booster, using high-test peroxide to ignite the fuel, can be started and stopped at will. Aerojet General will make it in the U. S.





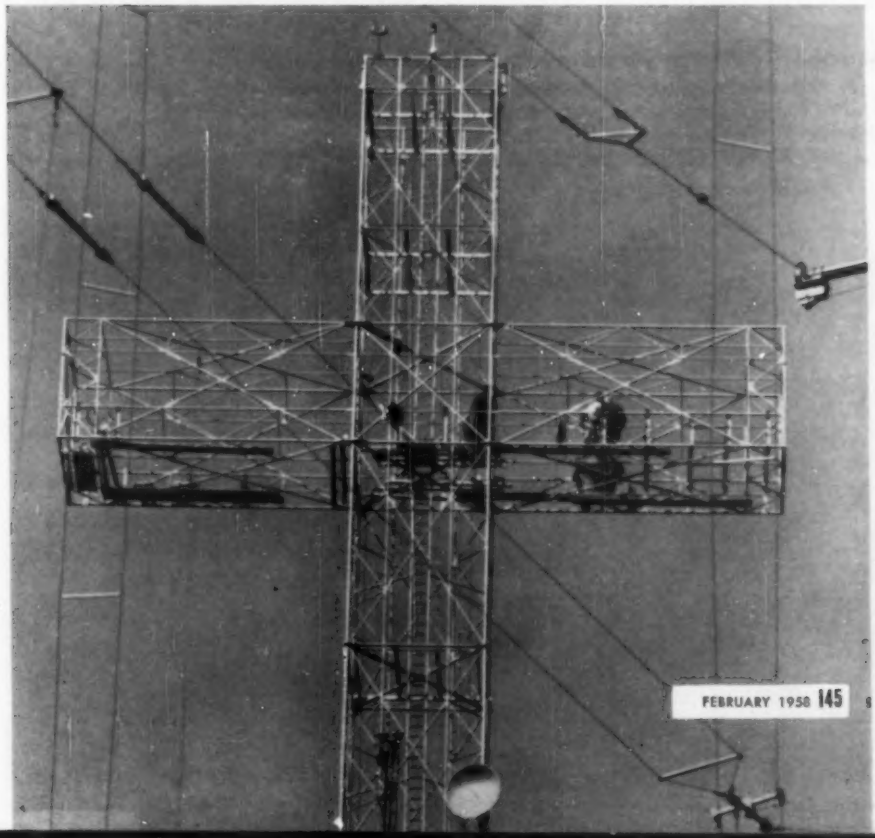


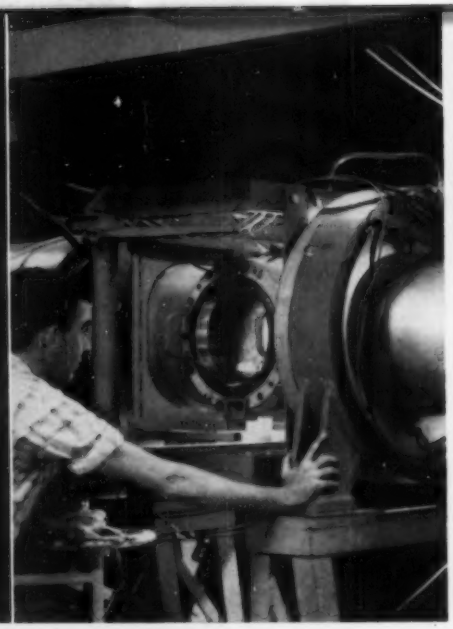
Fastest supersonic sled moves 1,500 feet per second

RIDING the world's fastest railway, this new rocket sled at Edwards Air Force Base in California is designed to travel at 1,050 m.p.h. to test aircraft components at supersonic speeds. Its Rocketdyne engine develops 50,000 pounds of thrust, runs on liquid oxygen (LOX) and alcohol.

Tower of new Vatican radio is shaped like a cross

THIS symbolically cross-shaped tower dominating the powerful new radio station operated by the Vatican will transmit the voice of the Pope to any part of the world. The antenna installation is at Santa Maria di Galeria, 11 miles north of Rome. Broadcasts are made in 40 languages.



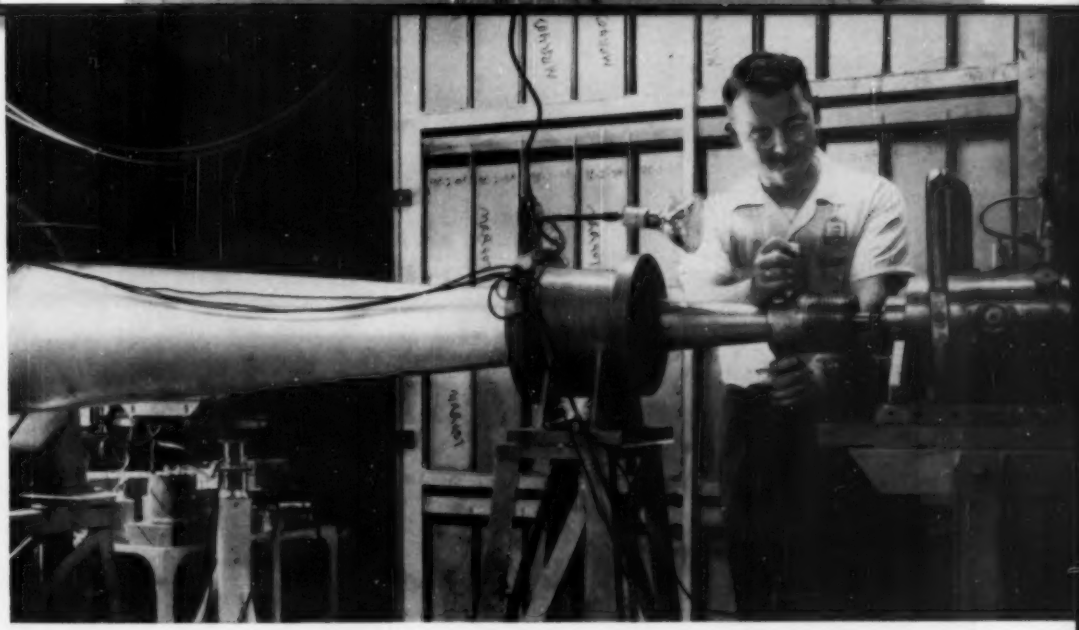


Incandescent air takes a shock picture of itself

ILLUMINATION for the photograph above, taken through a window (left) in the "Hotshot" wind tunnel at right, was provided by the air itself flowing over a cutaway cylinder at some 16 times the speed of sound. At this far-hypersonic speed, the air developed a pressure of 20,000

Mechanical arm photographs its twin in action

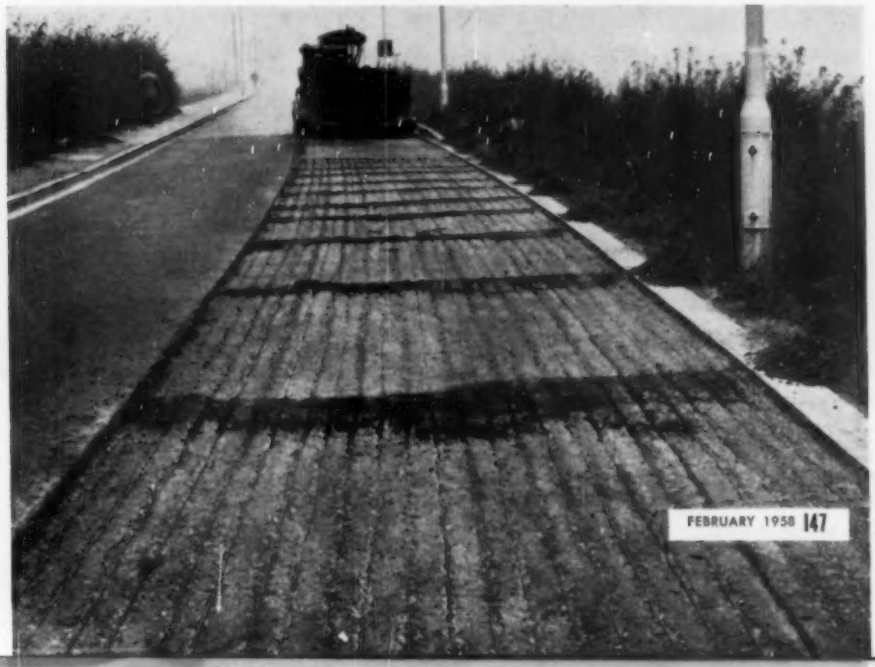
A PAIR of electro-mechanical manipulators, designed for remote control of radioactive substances, demonstrate their flexibility below at the Atomic Trade Fair in New York. At left, one of the "hands" operates a camera. At right is the picture it took of the other hand stacking blocks.

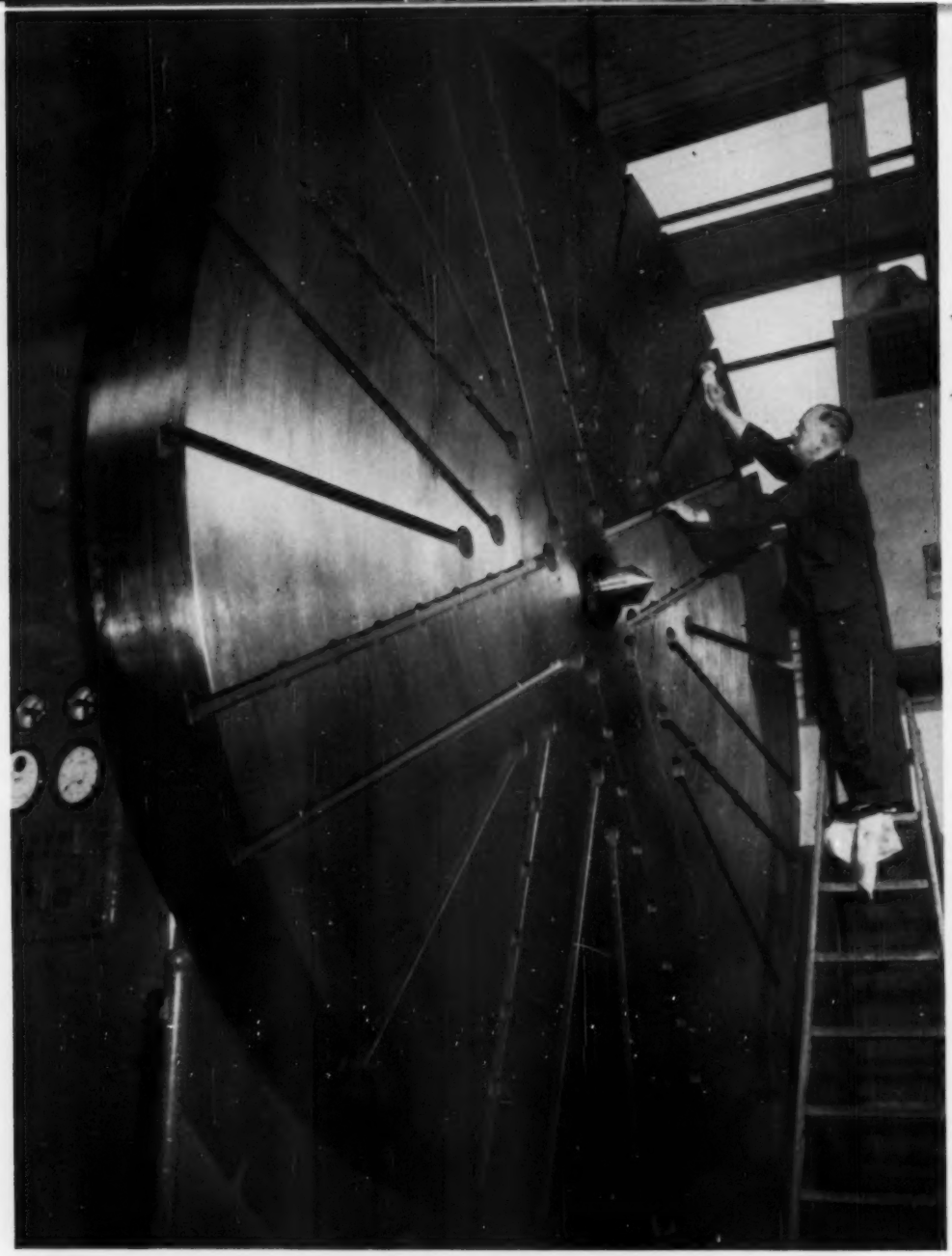


pounds per square inch and attained the incandescent temperature of 10,800 degrees to simulate conditions missile materials will meet on reentering the earth's atmosphere. The picture was taken during test runs lasting from 1/100 to 1/25 of a second. The tunnel is part of the gas dynamics facility at the Air Force development center at Tullahoma, Tenn.

Electric heating elements de-ice British road

To THAW sudden ice deposits on highways, the British Director of Road Research is trying two kinds of electric heat. Here a 100-foot section is laid with heating cables carrying a 240-volt charge under the road surface. Another strip uses a grid taking 30 volts from a transformer.



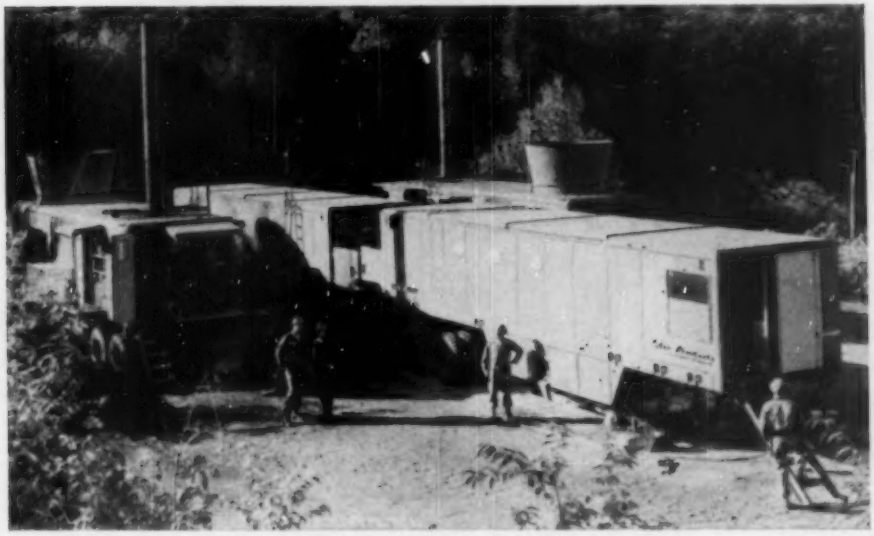


Gigantic faceplate made for 16-ton lathe

THIS faceplate for a 16-ton lathe measures almost 14 feet across. It's shown here being cleaned at the European engine-tool exhibit at Hannover, West Germany. The lathe will be shipped to India where it will be used to help make parts for industrial machine tools.

Watertight hull makes helicopter amphibious

A REINFORCED and fiberglassed hull bottom, plus outrigger floats, adapt this Navy HUP-2 helicopter to water as well as land. The amphibious copter was converted by Edo Corp. of College Point, N.Y., for use in carrier-escort and anti-sub warfare, and for over-water ferrying.



Rolling Army plant produces LOX from thin air

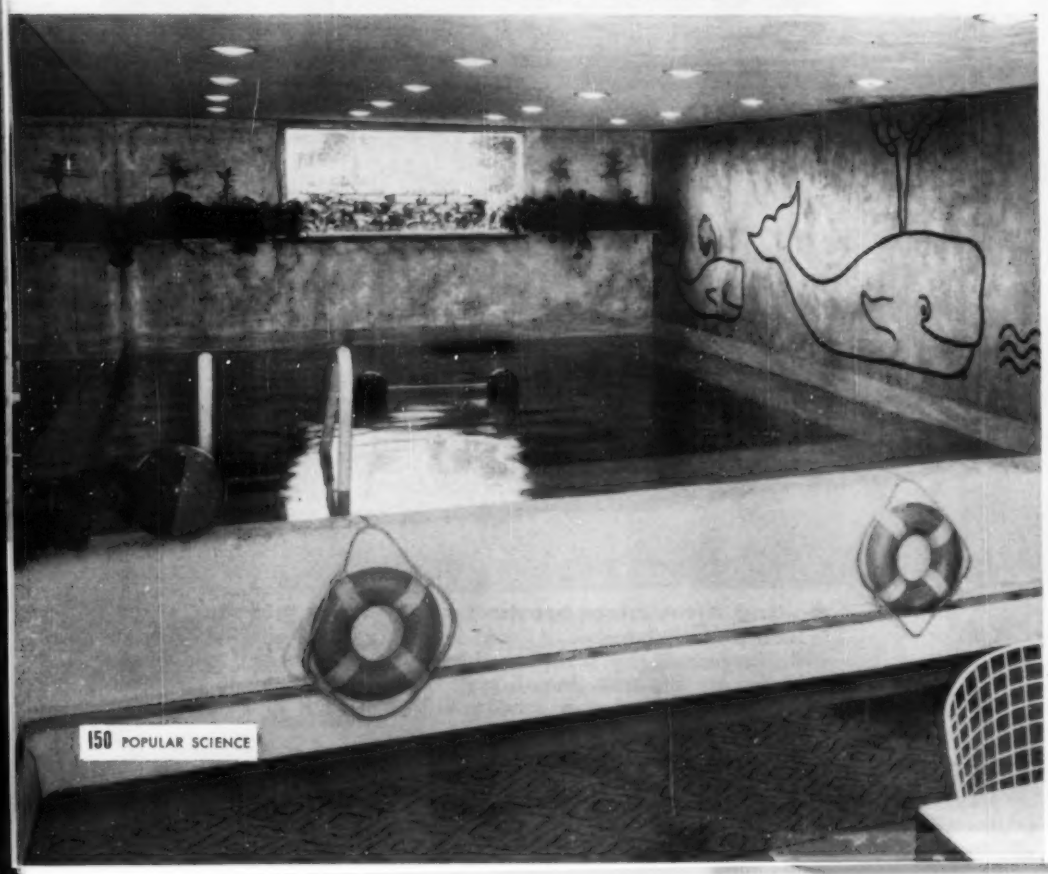
BATTLE-LINE production of liquid oxygen for guided missiles is possible with the Army's new plant on wheels. The three trailer units above, built by Air Products, Inc., liquefy oxygen from air with diesel-run compressors. The plant will make 20 tons of LOX in a 24-hour day.

Camera takes swivel-neck view inside new Chrysler

Here's what you'd see from the driver's seat of a new Chrysler—if you could swing your neck around like a movie-cartoon ostrich. Distortion in this photo—taken by a special camera with rotating

Development home comes with basement pool

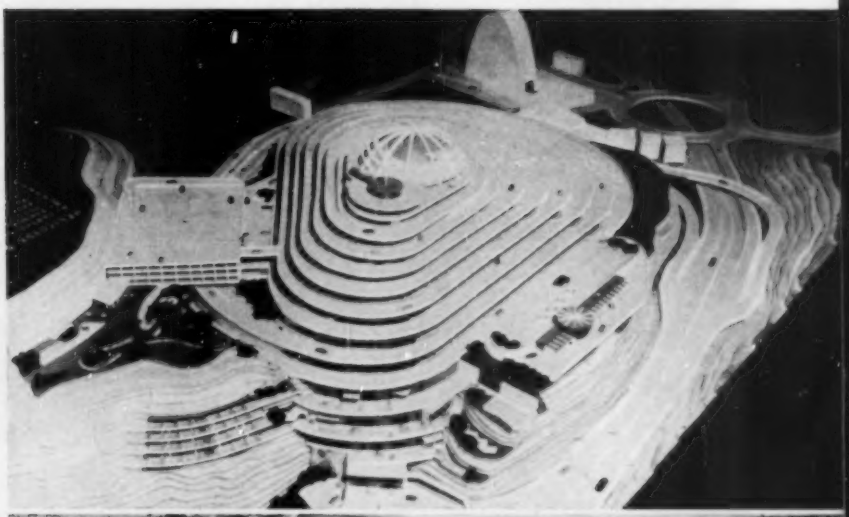
Now you can buy a house with a built-in basement swimming pool. Eden Roc Homes in Smithtown, N.Y., has them with the swimming pool optional: $20,000 to $25,000 without, $800 or more extra with the pool. Features include a mirror wall, picture window, 22 ceiling sun lamps.



gear—is minimized if you curve the magazine into a semicircle and hold it close to your eyes. The scenery shown here, from left to right: Windsor, Canada; Detroit across Detroit River (windshield); MacArthur Bridge (right window); Belle Isle (rear); and back to Windsor.

Spiral-pyramid business center is carved in mountain

On a 365-foot mountain overlooking Caracas, Venezuela, a "helicoid" business center is now underway (shown below in model and in making). It will provide showrooms, offices, garages, hotel, swimming pool and 320 stores, all reached by spiral ramp. Jorge Romero Gutierrez designed it.



This factory went up fast—it's built on balloons

THIS aluminum-dome factory, the first to be constructed on balloons, was built at Abilene, Kan., by 28 men in 22 hours. Two nylon balloons, one atop the other on a 145-foot concrete slab, were blown up one at a time, and Kaiser diamond-shaped panels were assembled on them as the balloons were filled. The factory, 50 feet high, will make conveyors.

She controls phone's volume

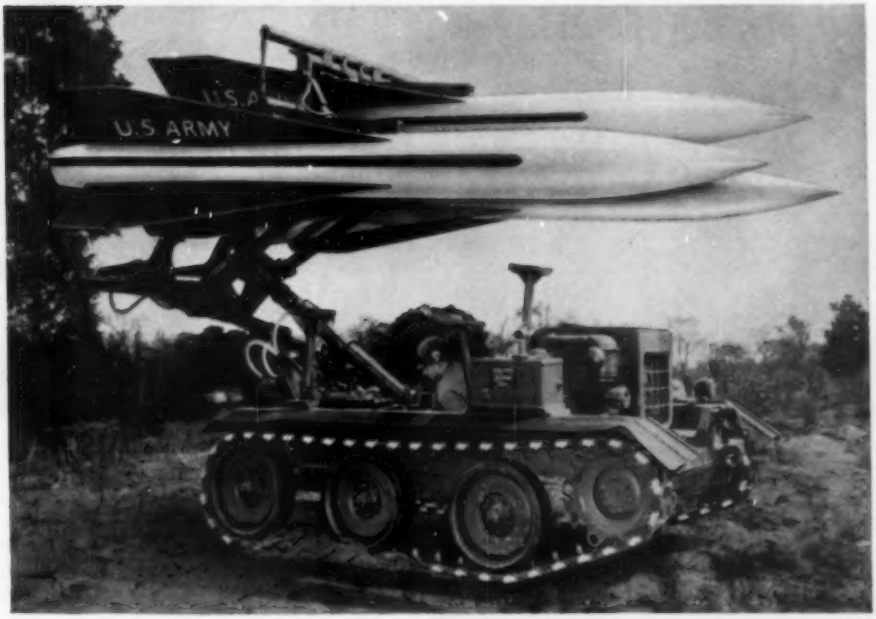
A KNURLED knob within finger reach on the new German telephone receiver above controls a small amplifier. The listener can turn volume at his end up or down.

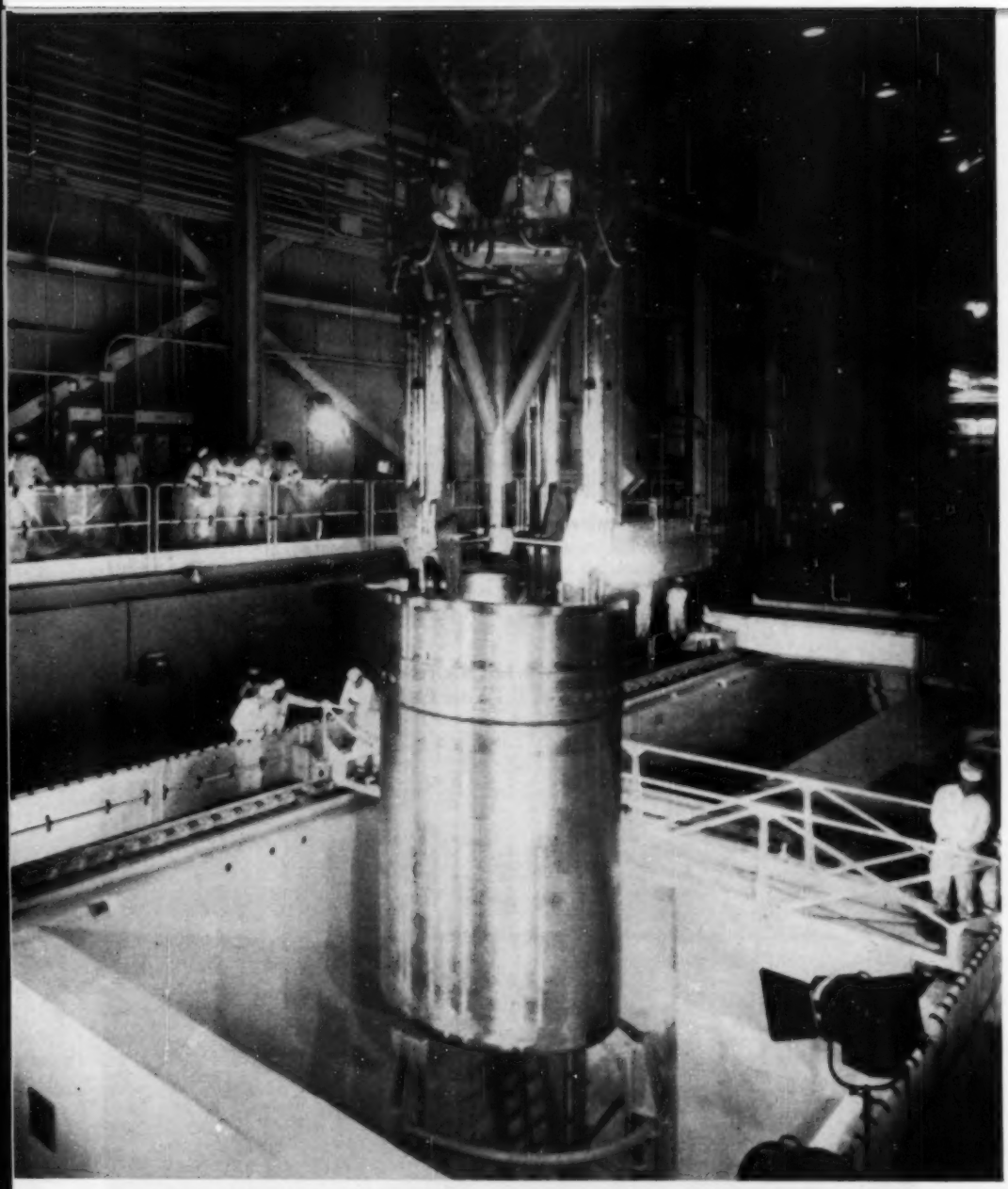
Seat takes jolt out of jeep

THIS canvas seat on an aluminum frame has rubber springs and drawstring adjustment for easy riding. Bostrom Mfg. Co., Milwaukee, makes it for Detroit Arsenal.

Triple loader rushes Hawk missiles to firing line

THE tractor-driven missile loader below is the Army's newest method of transferring deadly Hawk ground-to-air rockets quickly from storage to launcher. Self-propelled and highly maneuverable, the loader travels equally well over muddy or rough ground. Each will carry three "birds."





First full-scale atomic power plant gets nuclear fuel

HERE the nuclear core of the nation's first full-scale atomic power plant is lowered into position at the Duquesne Light Co.'s electric power plant at Shippingport, Pa. The big cylinder contains 14 tons of natural uranium and an additional 165 pounds of highly enriched uranium. All technicians engaged in the project are garbed in surgically clean clothing.

He boils electrons out of metal to turn heat into electricity

THIS "thermionic converter" makes electricity from heat in a new way, and gets eight percent of work from applied heat—compared with a thermocouple's one-percent return. GE physicist Volney C. Wilson, shown with the device above, expects to get up to 30 percent and to electrify more than the bulb at right.

Electrons are boiled out of a white-hot metal electrode and sent through an ionized tube to a cold electrode, producing current. The principle may lead to major new sources of electricity—from sunlight or from the heat of nuclear fission.

Biggest Boom

Electronic organs—easiest to play of all major instruments—are

By Robert Gorman

TO CELEBRATE his 79th birthday, a retired railroad man in Wichita, Kan., treated himself to an electronic organ. A few weeks later, though he had never played an instrument before, he was giving recitals for friends.

"I had so much time on my hands that I kind of wore out my other hobbies," he explained. "So I took up a new one."

With minor variations, this is the theme song of a new march of music that has no parallel in the history of sound. The zooming popularity of electronic organs is partly measured by a more than sixfold sales increase in four years—from 16,000 units in 1953 to an estimated 100,000 last year.

The oddest thing about the boom is that—by traditional standards—most organs are bought by the "wrong" people. That is, the majority of purchasers are older folks with little or no musical background.

This is in contrast to the long-term pattern of keyboard sales. Trade analysts point out, for example, that eight out of 10 pianos are bought either for children or for adults with previous training.

Who plays? Recent surveys have filled in a few other details about the new organists. Their average age is about 40, and women slightly outnumber men. When an organ comes into the home, more than half the family members learn to play. Most organs are bought for immediate fun rather than long-range cultural education. Though organ prices average over a thousand dollars, more than two-thirds of all purchasers have family incomes under $7,000. Skilled workers, the largest single group, are followed closely in organ ownership by white-collar, business, and professional people. Tens of thousands of owners have banded together in clubs that combine sociability with mutual instruction and, very often, community service.

From even this sketchy data it is easy to see the outstanding appeal of the modern electronic organ: It brings the pleasure of musical creation to people who missed the opportunity of mastering other instruments.

How and why have these various assemblies of motors, gears, vibrators and vacuum tubes been able to move in on what was once the most specialized of musical specialties? There are many contributing reasons, but the main push has undoubtedly come from the nature of the organ itself. Of all major instruments, it is the easiest to play.

That doesn't mean there aren't great variations in skill and artistry, but rather that the worst duffer can quickly learn to produce pleasant, *listenable* music.

Unlike pianos, whose tones tinkle briefly and die away, organs will sustain a sound as long as you press the key. So even when you pick out a tune note by note, the melody ripples smoothly along.

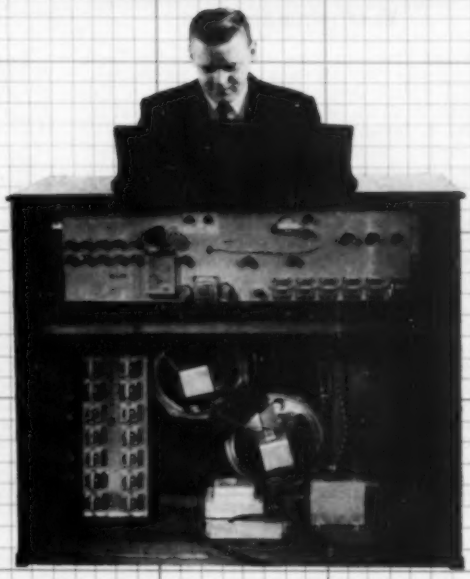
Playing an electronic organ is made easier by another characteristic that distinguishes it from other keyboard instruments: The ivories are electric switches, not levers controlling hammers or picks. That means the sound isn't affected by uneven fingering. You don't have to vary your touch to add expression to music; you merely adjust a volume control with your knee or foot.

These easy-play advantages are common to most electronic organs. Manufacturers and music publishers have made the most of them by devising various kinds of "picture music," "pointer systems," and other learn-at-home scores. One company proudly advertises to organ dealers that its home-instruction course is "not approved by old die-hard music teachers." It is designed, boasts the ad, "to sell the prospect, not make a musician out of him."

A giant step toward play-it-yourself music for everybody was taken a few years ago when the Hammond Organ Company—first and still largest in the industry—introduced the first chord organ. More recently, chord organs have

in Music

zooming in popularity



also been brought out by Wurlitzer and Thomas.

As its name suggests, this trim, low-priced newcomer makes the playing of chords all but automatic. To sound the three or four notes of a chord, you have only to press a clearly marked button with one finger of your left hand. This combination of one-finger chords, and the sustained organ tone that lets you pick out a flowing melody with one finger of the right hand, shatters the last barrier between buying an instrument and learning to play it.

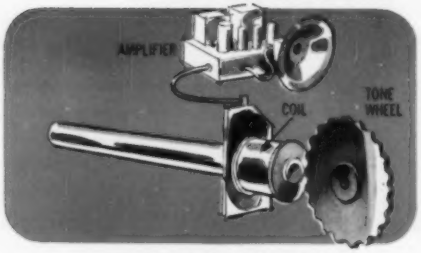
In organ language, the "musical resources" of chord organs are relatively limited. They have fewer "voices" than other models, and less range within each voice. But for most players, the things they don't have will never be missed. Thousands of sparkling chord-organ performances by concert and recording artists give evidence of their musical range.

The abundant variety possible in these babies of the organ world is indicative of the range of the larger, non-chord models: On most of them there is no practical limit to the musical sounds and special effects you can produce.

What kind of instruments are organs? How do they work? A dozen manufacturers now offer several times that number of models. These differ from each other in size, power, tone quality, and versatility as well as in their operating principles.

Electric or electronic? In order to dis-

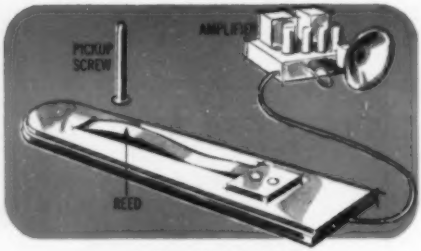
How they get their sound: These four types



ELECTROMAGNETIC

STEEL disks—or tone wheels—are the basic mechanism of all non-chord Hammonds. Motor-driven at a constant speed, each disk rotates in front of an electromagnet and induces a current in the magnet's coil. The frequency of the induced current is determined by the number of high and low spots on the rim of the disk, and each tone wheel is carefully machined to put out a pure fundamental, or sine wave. Standard models have 91 disks—61 tuned to the notes of a five-octave keyboard, plus 30 pedal and harmonic tones. All disks are constantly in motion, and thus constantly generating their fixed frequencies.

Voicing, or tone coloration, is controlled by Hammond's unique "drawbars." These are nine slide switches that mix the fundamental and eight harmonically related frequencies, and adjust the signal intensity of each. Since each drawbar has eight position settings, any note on the keyboard can be colored in thousands of different ways. Pressing a key sends its tone-colored note to phono-type amplifier and loudspeakers.



ELECTROSTATIC

THE vibrating reeds that generate tones in standard Wurlitzers are similar to those in older reed organs. However, a blower keeps all reeds vibrating all the time, and thus eliminates the time lag characteristic of individually blown reeds. Also, these brass reeds are enclosed in boxes to muffle their hum. What you hear are amplified signals, not the reeds themselves.

Each of the 73 brass reeds in the six-octave system is cut for the specific resonant frequency at which it will tend to vibrate once it is set in motion by the fan. Pickup screws are mounted near the free end of each reed. When small DC voltages are applied to a reed and pickup, they become, in effect, the plates of a variable condenser whose capacity changes at a rate corresponding to the reed's frequency. This produces an alternating voltage of the same pitch.

The voice or coloring of a note is affected by the type of pickup (which is why some reeds have more than one); in addition, "stop-tablet" switches on the console provide combinations of harmonics.

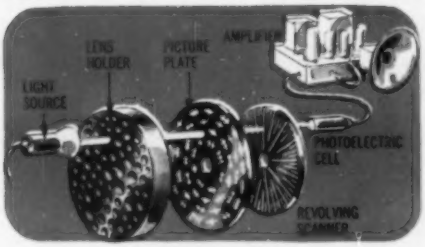
cuss the basic types, it is useful to distinguish between the two. Actually, both are electronic since both use vacuum-tube amplifiers to boost tone signals so they can be heard through loudspeakers. For greater clarity, however, the term electronic organ is often reserved for those models that use vacuum-tube (or transistor) circuits not only to amplify signals, but also to generate them. This category includes all chord organs and all but three of the many non-chord varieties.

The three electric—or, if you prefer, electromechanical—organs use distinctly different systems of tone generation (see diagrams above). The famous Hammond organ produces sounds electromagnetically; Wurlitzer's so-called reed organ is actually electrostatic. The third, or photoelectric, system illustrated should be available shortly in the new Kimball organ.

Whether they work mechanically, electrically or electronically, organ generators produce signal voltages. Each signal—selected by a key or pedal switch—corresponds in frequency to a particular note. Frequency, or pitch, is the characteristic that determines the place of any sound in the musical scale. Thus if a plucked string sets up air waves that vibrate at a frequency of 262 cycles a second, you call the resulting sound middle C; a 622-cycle wave is D-sharp in the octave above. Every note has its own frequency. It is the same whether that note be played on a piano or a flute.

Yet obviously a piano note sounds different from the same one played on a

of generators create most organ tones



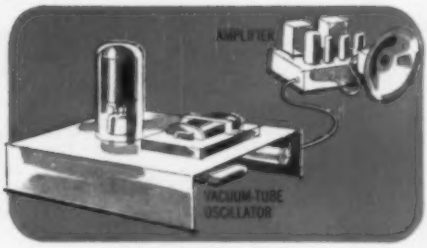
PHOTOELECTRIC

THE optical sound track on movie film is a close cousin of the photoelectric tone generator in the new Kimball organ. Standard models will have 12 generators, each providing a different voice.

A "picture plate" in each unit has outlines of five octaves, or 61 separate notes. When a key is pressed, a selected light shines through the appropriate "tone picture," and a lens focuses it on a revolving scanner. The scanner analyzes the beam and relays its distinctive characteristics to a photocell that then converts the light into a signal voltage.

A claimed advantage of this system is that it generates completely voiced organ notes—not clusters of fundamentals and harmonics that must then be combined by other circuits. And the tone pictures are said to be the exact copies (in optical recordings) of real organ sounds.

For a custom installation, it actually would be possible to "photograph" the notes of any of the world's great organs, then make up a composite instrument containing a dozen or more selected voices of your choice.



ELECTRONIC

VACUUM-TUBE (or transistor) oscillators furnish the signals that make sounds in all chord organs as well as in standard units made by Allen, Baldwin, Conn, Estey, Lowrey, Thomas and others.

Individually, electronic oscillators are simple circuits—Morse-code-practicing youngsters have been building them for several generations. But an electronic organ has several rows—or several dozen rows—of them, each designed to squeal at a selected frequency.

Design differences among electronic organs are partly reflected by an enormous price range, running from about $700 for the simplest home model to $30,000 or more for some auditorium installations. There are also many technical differences among organs of comparable price.

Some designers, for example, prefer to create pure sine waves, then synthesize instrument voices by combining fundamentals and harmonics. Others design organs to generate signals rich in harmonics, then filter out the ones that aren't wanted.

---

flute. The difference is that a flute speaks in a fairly "pure" voice while string sounds are rich in harmonics. These harmonics, or overtones, are related-frequency vibrations—that is, fractions or multiples—that blend with the fundamental frequency to form the total sound.

Every instrument has a distinctive pattern of resonant frequencies (called a "formant") that gives it its unique voice. Since an organ imitates many different instruments, it must have some means of recreating the proper formant of each one. This can be done in several ways.

In some organs individual generators put out pure tones which are then combined in varying proportions to simulate a desired resonant pattern. Others start by generating complex, harmonic-rich waves, then pass them through filters that emphasize some harmonics and diminish others. The variety of voices available in any organ depends partly on the type of combining circuits employed, and partly on the number of independent tone generators. For all practical purposes, however, electric and electronic systems can simulate any "authentic" organ voice—and quite a few others.

What are these voices? How and why are they chosen? Most of them derive, by a roundabout path, from thousand-year-old pipe-organ traditions.

Essentially, a pipe organ consists of a bellows (or wind chest), a set of pipes, and an assortment of slides and levers that open and close gates between the

[*Continued on page 244*]

The fastest man alive describes his sensations while setting the world's speed record in a rocket plane:

I Flew 1,900

Early in the morning of Monday, July 23, 1956, Lt. Col. Frank K. Everest Jr. (left) climbed into the cockpit of a Bell X-2 rocket plane. His goal: a speed never before attained by man—three times that of sound. This story of Everest's epoch-making flight, from takeoff to landing, is from his book "The Fastest Man Alive," to be published later this month by E. P. Dutton & Co., New York.

By Lt. Col. Frank K. Everest Jr. as told by John Guenther

THE purpose of the ninth powered flight of the Bell X-2 rocket plane was to expand the speed/altitude envelope to a point approaching Mach 3. This would be faster than man had ever flown before. We were shooting for three times the speed of sound, which is nearly 2,300 miles an hour at sea level. Of course, my true air speed would not be that high where I was flying, as the speed of sound decreases with altitude.

I was well aware of what I was getting into. Before this flight, as on previous tests, I had flown the GEDA machine, a Goodyear electronic digital analyzer, which could predict actual flight conditions based on the information we gave it. We had fed in the various stability parameters at anticipated Mach numbers, and had noted that under certain conditions the airplane would "uncork" and go out of control.

For example, if I pulsed the ailerons too much—moved them too far—at the higher Mach numbers, the X-2 would become uncontrollable. Or if I made too tight a turn at high speeds, GEDA would show me going out of control. The high-speed flight station at Edwards Air Force Base, which furnished us much of the advice and guidance on X-2 instrumentation, had extrapolated previous flight data and forecast the stability limits of the airplane. They told me frankly what the dangers were on future flights. I followed directions and that is why I am here today.

Preparation for the flight began on Sunday. The water alcohol was cooled to zero degrees Fahrenheit in order to condense it and get the maximum fuel load on board. The Bell ground crew and technicians completed preflight inspection of the aircraft and engine, after which NACA personnel installed high-speed flight instrumentation and established zeroes. New batteries were installed and then the X-2 was mated to its B-50 mother ship in preparation for a dawn takeoff the following morning.

Instrumentation included pressure pickups for the rocket chambers, the fuel and LOX tanks, the intake and exit ports of the gas generator, and the intake and exhaust for the turbine pump. Strain-gauge pickups were installed on the rudder, ailerons and stabilizer to measure the forces that I would apply to these control surfaces. We also installed position pickups on the control stick, rudder and control surfaces to determine the position of all controls and their surfaces at all times during the flight.

A yaw meter would measure the degree of yaw of the airplane in flight. Another instrument measured the angle of attack. Roll-and-bank and acceleration instruments gave us a record of acceleration in all directions—fore and aft, lateral and longitudinal. The X-2 also carried a radio transmitter that I would use to report my progress verbally.

Because I expected to run into high-speed heating on this flight, we had installed surface-temperature pickup gauges

M. P. H.

DROPPED FROM B-50 BOMBER at 30,000 feet, the X-2 falls free, streaming fiery vapor from its twin-chambered rocket engine. The X-2 holds two world's records for piloted aircraft: speed and altitude.

to measure the air-friction temperatures. We had also painted the airplane with stripes of heat-resistant paint. They were of various bright colors, each color designed to withstand a specific temperature before it melted, and the nose and leading edges of the X-2 looked like a rainbow. As each color melted and started to run, we could estimate the approximate temperature encountered on that part of the airplane.

A radar homing beacon was installed to enable the NACA-calibrated radar station at the main base to follow my flight. Both NACA and Air Force radar would track me, giving my speed and altitude as a check against my flight instruments.

At four a.m. on the flight line at South Base Monday morning, Jimmy Dunn, the X-2 crew chief, signaled his ground crew to begin pumping six tons of water alcohol and liquid oxygen into the waiting rocket ship. Working in predawn darkness, the sleepy men moved silently about the airplane, making it ready for another assault against space.

It was five a.m. when the alarm clock roused me from my sleep. The first light of morning was creeping above the eastern desert, and looking out the window to check the weather, I saw with concern that the sky was overcast. The X-2 did not have all-weather capabilities, and I could not attempt a deadstick landing through clouds. I had built myself up mentally in preparation for this flight and did not relish canceling it.

I immediately telephoned the weather officer at the base for a prediction of cloud cover at takeoff time. He forecast three- to four-tenths cover at seven a.m., which would not be a problem.

For breakfast I had an eggnog and a piece of toast. I was not hungry and couldn't eat more. After breakfast I went in to see the children but they were still asleep. Avis came out on the porch with me and I kissed her goodbye. "Wish me luck," I said. She was under the same pressure I was, and both of us were a little tense. She clung to me a moment, then straightened up, smiling. "I wish you all the luck and love in the world," she said.

I drove to the flight line to check on the airplane, then continued to my office to dress for the flight. The other pilots were already there waiting for me—Capt. Fulton, the B-50 pilot, and the three chase pilots, Maj. Childs, Capt. Apt, and Capt. Kincheloe. Capt. Wray had my pressure suit laid out and helped me put it on. I studied my preflight check list a few minutes, then drove back to the flight line for a 6:30 takeoff.

Takeoff was delayed about 15 minutes, so I stood around with the other pilots and the Bell people, talking and watching them finish fueling. I talked to Bob Lapp and Jimmy Dunn about the airplane. But mostly we just stood around and waited, kidding back and forth. There was more than the usual amount of tension in the air and we were all trying not to show it.

At 6:45 Jimmy Powell called the B-50 crew to board the aircraft and activity began to increase. I zipped up my pres-

sure suit and put my heavy flying suit on over it. One last handshake with the men remaining behind, and I got in the B-50.

We taxied out and received tower clearance, and less than a minute later were airborne. After gear and flaps came up I went back in the B-50 and sat down near the X-2's control panel with Bill Fleming, the Bell panel engineer. Capt. Wray helped me adjust my pressure helmet and strapped it down. Then he connected my bail-out bottle to the pressure suit and strapped on my parachute. I took a last

CLOSE-UP OF WORLD'S FASTEST PLANE, the Bell X-2 rocket ship that traveled nearly 2,000 m.p.h. It was built of K-monel metal and stainless steel. Its engine developed 100,000 horsepower.

look around the bomb bay and entered the X-2.

Wray and Ernie Kreutinger, the Bell top-off man in the B-50, followed me down and helped strap me in the cockpit. After I was strapped in and connected to the oxygen and radio outlets, I checked in over the radio with Fulton in the B-50 and Jimmy Powell on the ground. The radio checked okay and I went to the other items on my preflight check list—turning on the circuit breakers, checking hydraulic pressures and flight controls, turning on my oxygen system.

Sunlight was now flooding the B-50 and the X-2 as we climbed laboriously upward, circling slowly in a heavy spiral that would take us to drop altitude six miles above the ground. But below us daylight had not yet reached the desert where the little cavalcade of vehicles moved in semidarkness across the lake bed to take up its position at the south end of the lake. It moved slowly through the main gate, the radio truck leading the way, followed by eight or nine other vehicles carrying the 50-odd men and women who would follow the news of my flight and meet me when I landed. Silently now, listening for any word from the B-50, they regrouped themselves half a mile off the landing strip and waited.

Up in the X-2, Wray and Kreutinger carefully slid the heavy canopy into position and I locked it from the inside, sealing the cockpit against the outside world until I was once more back on earth. Despite myself, I felt a pang of loneliness and isolation when they climbed back into the B-50 and moved out of sight in the bomber.

We were above the clouds now, still climbing, but the overcast had increased. Weather reported by radio that cloud cover was four- to eight-tenths overcast. But looking out of the cockpit, I could see the desert through occasional holes in the clouds and told myself I could pick up a landmark and land safely.

Our course was east, to where I would drop in a westerly direction. On rocket burn-out I should be above Bakersfield, Cal., in position to turn and glide back to a landing. Cloud cover was now seven-tenths overcast and altitude 33,000 feet. With its heavy load, the B-50 would not go any higher. Capt. Fulton nosed over to pick up speed for the drop and his dive carried him 2,800 feet toward the ground. At 7:45 a.m. he tripped the lever that released the bomb shackles in the big bomber. The X-2 fell free in the morning light.

My gloved fingers depressed the locking button on the throttle as I fell and locked it in full-power position. With a force that slammed me back against the cockpit wall, both rocket chambers roared into life and the fiery energy thrust the falling airplane forward. Shaking my head

I could not hold it down . . . It hungered for the whole sky"

to clear it from the shock of the sudden acceleration, I pulled the wheel slowly back toward my pounding heart and began the familiar climb upward.

The X-2 leaped forward convulsively, eating air, and I knew at once that I could not hold it down. Today it hungered for the whole sky. This appetite for speed was ravenous and would not be denied. Again I attempted to keep a predetermined climb schedule, and again the airplane was running away from me. Fighting the controls, struggling to hold a steady flight path, at 50,000 feet I was already supersonic. Very carefully now, afraid of overcontrolling, I began the familiar push-over toward level flight.

Automatically I discounted the time lag in my altimeter and Machmeter. My instruments could not keep up with the fantastic acceleration. Altitude was 50,000 feet indicated, 55,000 true. Rounding out now, I would be straight and level at 60,000 feet indicated, true 65,000.

All the instruments were lagging. I held the control stick with both hands, still pushing forward. My senses were extremely acute and drawn to one point in time, luminous and aware and waiting for the unknown to happen. In my hands I held the reins of 100,000 horses.

Level—now. Ready—now. The airplane accelerated on up and I watched the Machmeter climb to a speed I knew had never before been flown by man. I observed some debris coming over the nose of the plane and hitting the windshield. Worry now, until I thought of paint blistering and coming back over the cockpit. This was the heat barrier.

But I had no time to think about it. I was too busy flying. The airplane handled beautifully. Still in level flight, it continued to drift on upward, hurled skyward by the incredible momentum of its climb. Speed was over 1,900 miles an hour. I felt like an explorer, like Columbus and Magellan. I was both awed and proud.

Except for the hiss of air over the cockpit and the far-off crackle of static over my radio headset, I heard nothing. I was acutely conscious of absolute stillness and calm, a solitary world in which I was suspended, alone in time and space.

Aided by its modified fuel probes, the rocket engine burned four seconds longer than ever before, then sucked the tanks bone dry of fuel and burned out.

I pulsed the ailerons to the left, to the right, then did a stabilizer pulse to the positive position. I could detect very little yaw tendency, but I noted a definite decay in lateral stability. When I released aileron pressure and returned the controls to neutral, the airplane continued rolling in the direction of the control movement, and I had to apply opposite control to stop the roll.

By pulsing the controls, I mean maneuvering, a movement of the stick. If I pulsed the ailerons too far, I knew from the GEDA machine that the X-2 might not stop rolling.

For this reason, I pulsed the stick very gently, just an inch or two sideways, then returned it immediately to neutral to observe the reaction of the airplane. I pulsed it to the left again, then to the right. Then an inch or two in the rearward position. I noted that the airplane was still controllable and I felt it could be flown safely at these speeds or a little faster. However, control was marginal, and if the pilot maneuvered too violently, anything could happen.

When I finally broke radio silence I said one word, "Bingo!" Unless I reported in code, which I forgot to do in my excitement, that was all I could say in the open. But to the listeners many miles below me, it said what they were waiting to hear. This was it—this time we had done it! They knew then that I had approached the higher Mach numbers we hoped to reach.

Glancing quickly out of the cockpit at the toy landscape far below me, I tried to identify my position over the California desert. I reported to my chase pilots and asked if they had me in sight—they did not. Without the exhaust from my rocket engine, they no longer had the guide by which they tracked me.

Giving them what I thought was my position over Bakersfield, I made a right turn back toward Edwards and began my letdown. Speed was still supersonic, and again I performed aileron and stabilizer pulses to test control and stability of the airplane, being extremely careful not to overcontrol. Although engine power was

[*Continued on page 238*]

How We May Get H-POWER

Authentic data and photos, newly released from secrecy, present an exciting picture of the next atomic wonder: the peacetime use of controlled fusion

By Alden P. Armagnac

WHAT'S behind the headlines you see these days, like "Baby Sun To Aid H-Power Studies" and "British On Way to Use of H-Power"? They're items in the exciting story of what may be the next great advance in nuclear energy—atomic power from fusion. Here are the answers, some of which can only now be given, to the questions a layman may ask about it:

What is fusion?

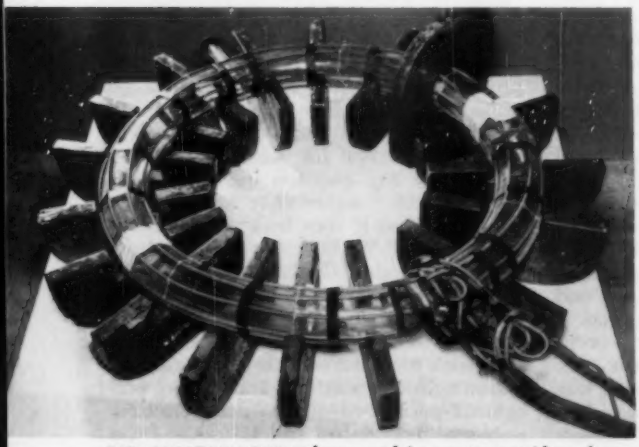
It's the source of the sun's heat, and of the H-bomb's terrific power. Thermonuclear energy is another name for it.

A hydrogen bomb's explosion is a fusion reaction out of control. If fusion could be controlled and tamed, that awesome power could be put to peaceful and constructive use.

Is that at all possible?

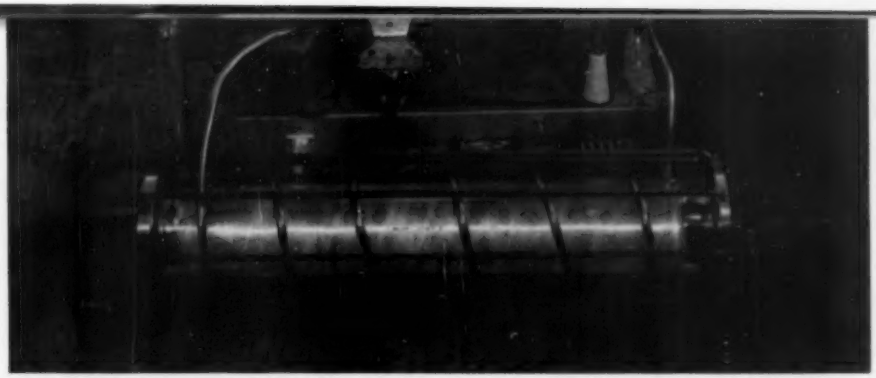
So much progress has been made toward it that now researchers are going from toy-sized experimental models to big-scale apparatus—like the "baby sun" of the headlines, a projected multimillion-dollar U. S. machine called the Model C Stellarator.

Until lately the whole business has been wrapped up in secrecy. But now the wraps have been lifted enough for a peek at what's been going on, from first principles to latest developments.



PERHAPSATRON TUBE, above, and its use to test idea of confining super-hot reaction in magnetic bottle are shown in views now released of long-secret U. S. fusion experiments.

UNDER OBSERVER'S CONTROL, electric discharge of 12,000 amperes applies a magnetic "pinch" to the



MAGNETIC BOTTLE, named Columbus, pinches hot gas into a luminous line—and gives preview, in miniature, of what the multimillion-degree "flame" of a fusion furnace may look like.

To begin with, what's the difference between fusion and the kind of atomic power we have already?

So far, nuclear reactors run on uranium, or plutonium, or thorium. Those fuels release their energy when the hearts of their atoms split in two. Fission is the name for it.

Fusion is just the opposite. A fusion fuel's atomic particles, instead of splitting in two, join themselves to others. That liberates even more energy than fission does, pound for pound of fuel.

What would be the fuel for fusion?

Deuterium, also called heavy hydrogen, looks like the best. When it fuses, it turns into helium. By-products are ordinary hydrogen, tritium or extra-heavy hydrogen, and many neutrons. That's the overall result of several reactions taking place at once.

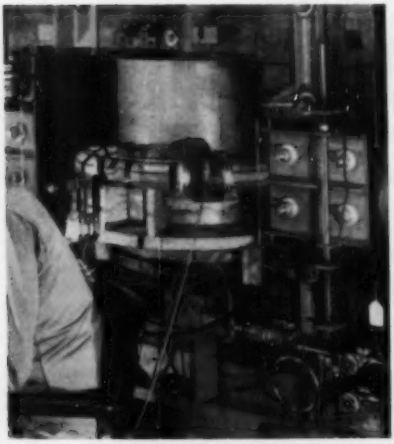
Where do you get the deuterium?

The oceans are full of it. Water—it's H_2O, you remember—contains hydrogen. And about one part in 6,000 of all natural water is heavy water, the kind whose hydrogen is heavy hydrogen.

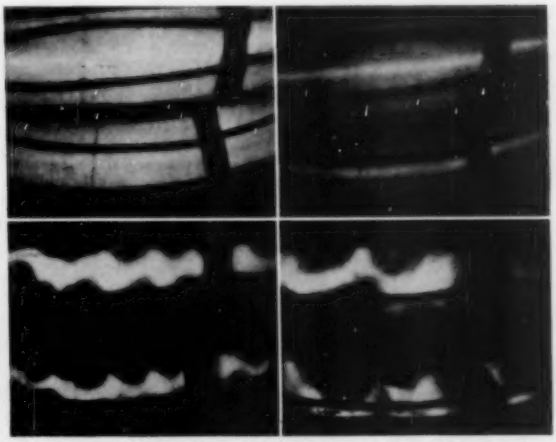
There's enough deuterium in the seas to provide all the world's fuel for a billion years to come, at 1,000 times our present rate of energy consumption.

Is that why we want fusion power?

Yes. There is only a limited amount

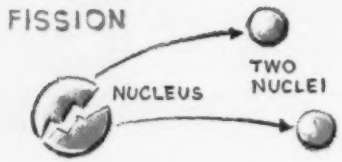


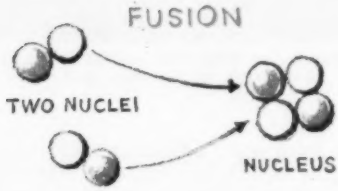
gas within the Perhapsatron tube, which has been placed at center of six-ton magnet in background.



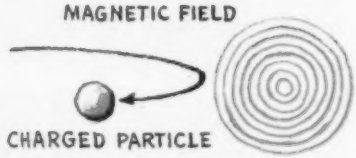
GLOW, PINCH (upper right), kinking, and pinch's breakup successively follow discharge, as seen through tube's taped-on wiring. Mirror gave twin side-and-bottom views.

Drawings show principles of H-power, how they might be applied,

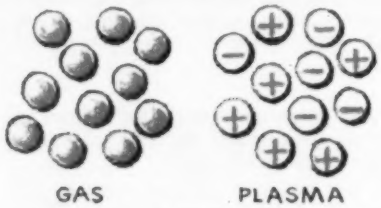




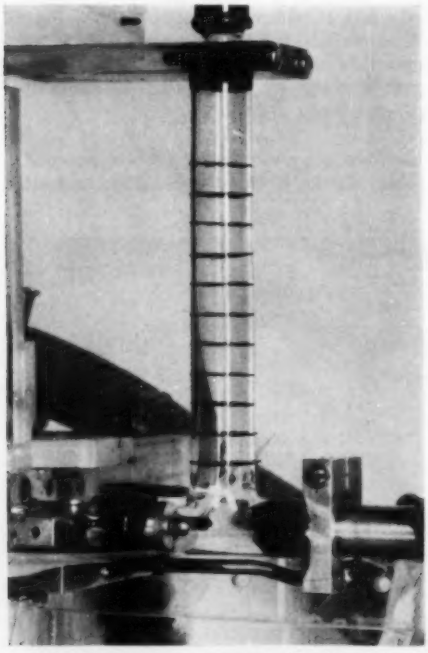
IN FISSION, which gives the kind of A-power we have now, atomic particles split in two. In fusion, they do the opposite, joining to make bigger ones.



MAGNETIC FORCE, which could confine fusion fuel, acts on gas if it is charged.



DEUTERIUM FUEL is therefore turned from ordinary gas into charged one (plasma).



ELECTRIC SHOCK TUBE magnetically drives shock wave upward, through deuterium gas in vertical section, in tests seeking gentle way to ignite fusion reaction. Modified version of tube has given 1,200,000-degree heat, by NRL estimate.

of coal, oil and uranium in the world. Sooner or later we'll use them up. But the supply of deuterium is practically inexhaustible.

How do you extract the deuterium?

First you separate the heavy water—by distillation, electrolysis or a newer method called chemical exchange. Then you can easily decompose the heavy water, with electric current for instance, and get the deuterium. It's a gas, just as ordinary hydrogen is.

Will deuterium be expensive?

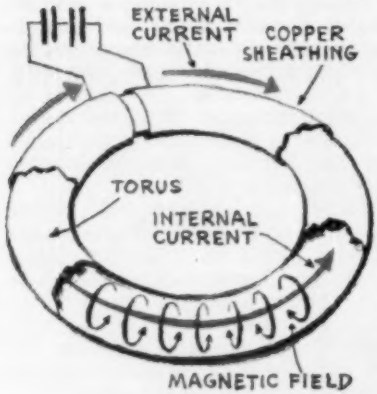
With heavy water currently selling at $28 a pound, deuterium by one estimate should cost about $400 a pound. That's a bargain; it will yield 30,000,000 times as much energy as an equal weight of gasoline.

What are we waiting for, then?

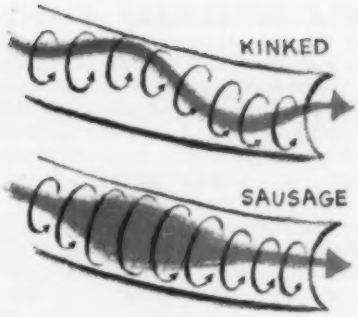
There are three staggering problems to lick before we can build a fusion-power plant: how to light the fire, how to put a firebox around it, and how to extract the power.

Take the first one. To kindle a self-sustaining fusion reaction in deuterium, somehow you must heat it to the astronomical temperature of 700,000,000 degrees F.

and some "bugs" of early schemes



SIMPLEST MAGNETIC BOTTLE is gas-filled torus (doughnut-shaped tube). Current around sheath induces current in gas, to confine it by magnetic pinch effect.



"INSTABILITIES" of these three kinds plagued early magnetic-bottle experimenters. Instead of holding steady, column of hot gas wriggled, bulged or became fluted in cross section.

Mixing tritium with the deuterium would lower that appalling figure—but it will still take at least 180,000,000 degrees to set any kind of fusion fuel ablaze.

Can we ever manage to do it?

It's actually been done, we know, because a fusion reaction has been brought off in H-bombs. To ignite it, the H-bomb has a built-in A-bomb, which furnishes the multimillion-degree heat. But you obviously can't start a fusion-power plant with an A-bomb, so experimenters have been seeking a gentler way to reach extreme temperatures.

Now they believe that they've found the answer.

How would they do it?

By heating the gas with shock waves. In theory, at least, that could raise a gas directly to "thermonuclear temperatures."

A shock wave is a faster-than-sound wave of pressure, as from an explosion. In fact, some early fusion experimenters abroad actually exploded small "shaped" charges, and made gas so hot that it became luminous (PS, June '53).

Now it's revealed that U.S. and other fusion researchers are using a much more advanced technique, which consists of driving shock waves through a gas magnetically. The waves are propelled either along a tube or, in other setups, from the walls of a tube toward the center. Even on a small scale, results have been rather fantastic.

An "electric shock tube" is believed to have heated glowing deuterium gas to more than 1,000,000 degrees F., in fusion tests at the Naval Research Laboratory. Figures attained in trials elsewhere in the U. S. are still to be disclosed.

Probably there remains a long, long way to go—but the experimenters seem confident that kindling the fusion fire won't be their hardest problem.

What's the toughest one, then?

The firebox is the prize problem. No material exists that can stand up to that kind of heat. Every known substance would vaporize instantly. So your strange task is to construct a firebox out of nothing at all.

Can there possibly be an answer to that one?

Yes—a magnetic bottle.

The idea would be to confine the superhot deuterium gas within a powerful magnetic field, while the fusion reaction took place.

The deuterium would first have been

ionized, or charged. Passing an electric current through it, or simply heating it to the extreme temperatures at which fusion could occur, would ionize it. The resulting swarm of charged particles—the fusion workers call it a plasma—will respond to the effect of a magnetic field, although an ordinary uncharged gas would not.

Since there has to be some solid and tangible apparatus somewhere, the "magnetic bottle" actually would be a tube, filled with deuterium to start with. Then magnetic force would hold the deuterium well away from the tube's inner walls, leaving a vacuum along them.

In magnetic-bottle experiments from which the secrecy has just been lifted, this was done by applying a curious phenomenon called the pinch effect.

COPPER STRIP, before and after 265,000-ampere jolt, dramatically illustrates "pinch effect." Metal is squeezed as if by giant fist.

What, exactly, is that?

A homely illustration of the pinch effect is what happens to a copper drain pipe when lightning hits it. The pipe crumples up as if squeezed in a giant fist. So do flat copper strips given a quarter-million-ampere jolt, in General Electric's artificial-lightning laboratory. The explanation is that the mighty current creates a powerful magnetic field; this, in turn, puts a squeeze on the current-carrying metal.

The same thing happens to a tubeful of gas carrying a heavy current, it was first observed in 1951. The current's own magnetic field pinches the gas away from the tube's walls and toward the center. When suddenly discharged through the gas, the current whams it together, and you get shock-wave heating in the bargain.

That was the scheme of working models built to test the magnetic-bottle idea.

What did they look like?

One was an endless doughnut-shaped tube about two feet across, nicknamed the Perhapsatron, and tried out in '52-'53 at the Atomic Energy Commission's Los Alamos Scientific Laboratory. A condenser discharge of 12,000 amperes was shot through electric windings around the three-inch-diameter tubing, and that induced another current in gas within the tube. The gas glowed brightly and, within a few millionths of a second, an exciting thing happened. The glow shrank to a luminous thread along the tube's center. Magnetic force was pinching it—as they'd hoped it would.

A second magnetic bottle built by the Los Alamos team was a straight quartz tube, about a foot and a half long, called the Columbus. Through gas in this tube, a triggered spark gap hurled more than 100,000 amperes of current, pinching the glowing gas into a luminous line down the center.

Encouraging as this looked, the trials showed there was a catch, so serious that it threatened to wreck the scheme.

What was that?

The pinch didn't last. Quicker than you could say "pshaw," the glowing thread of plasma would wriggle, kink, and break up.

A current held by its own magnetic field, it turned out, had unruly ways of behaving—"instabilities." It strayed into a winding path—and then, like a meandering river, it kinked more and more. Or, when the "pinch" happened to squeeze the plasma a trifle sooner in some places than others, you'd get alternate pinches and bulges like a string of sausages; and the bulges rapidly grew.

An alternate magnetic-bottle scheme, providing an external magnetic coil to confine the plasma, struck a similar snag. In this case the column of plasma, departing from a nice round cross section, took on a more and more fluted shape.

Why was that bad?

First, the pinch didn't hold steady for even the second or two that it might take to start a fusion reaction.

Worse yet, the kinks or bulges or flutings quickly reached the tube's wall—

[*Continued on page 240*]

New Ideas from the Inventors

1 V Plows Clear Tracks in Snow. With these recently patented wheel plows hooked to the bumper, even a light car or truck might be able to dig its way through snow. For instead of trying to bulldoze tons of snow to clear a car-wide path, the plows would merely slice out two narrow tracks for the wheels.

2 Clothesline Unreels Pins. A housewife wouldn't have to fumble with loose clothespins to hang wash on this line. Permanently—but slidably—attached to the line, pins stored inside the pulley housing would travel out with the line, go back as the line was reeled in.

3 Printed Batteries Save Space. To form dry cells on thin sheets, this inventor would orient metallic-ink particles magnetically. The proper electrochemical action could take place, he says, because each layer could be made conductive without direct layer-to-layer contact.

Please turn the page for more new ideas

More Inventors' Ideas

4 Plate Clip Holds Butter Knife. Buffet meals might be easier to eat if hostesses provided plate-edge clamps like those shown above. Slipped onto the rim of a dish, the clamp would provide a non-skid holder for a pat of butter and a spring gripper for the butter knife.

5 Spinning Mirror Sheds Snow. Keeping a rear-view mirror whirling rapidly wouldn't affect the images it reflected, but should keep snow, sleet or rain from settling on the glass. The mirror's shaft could be battery- or wind-driven, or powered by engine vacuum.

6 Liquid Clears Picture Window. You wouldn't have to sacrifice light for privacy with a window like this. Two sheets of translucent glass would normally admit light while blocking the view. But by pumping between the panes a liquid with the refractive index of the glass, you could make them transparent.

7 Radiation Tags Forgotten Sponge. To provide a sure and simple way of accounting for all surgical sponges used in an operation, this inventor would embed pellets of harmless radioactive material in the gauze pads. After the operation, a Geiger counter could track them down.

8 Collar Coils Dog's Leash. Instead of unhooking this leash when you wanted to let your dog run free, you'd just drop the end. A spring would coil the leather strip inside the collar. A sliding license-tag holder would adjust the length that could be drawn against the spring, and thus permit a quick change from a short leash to one of normal walking length.

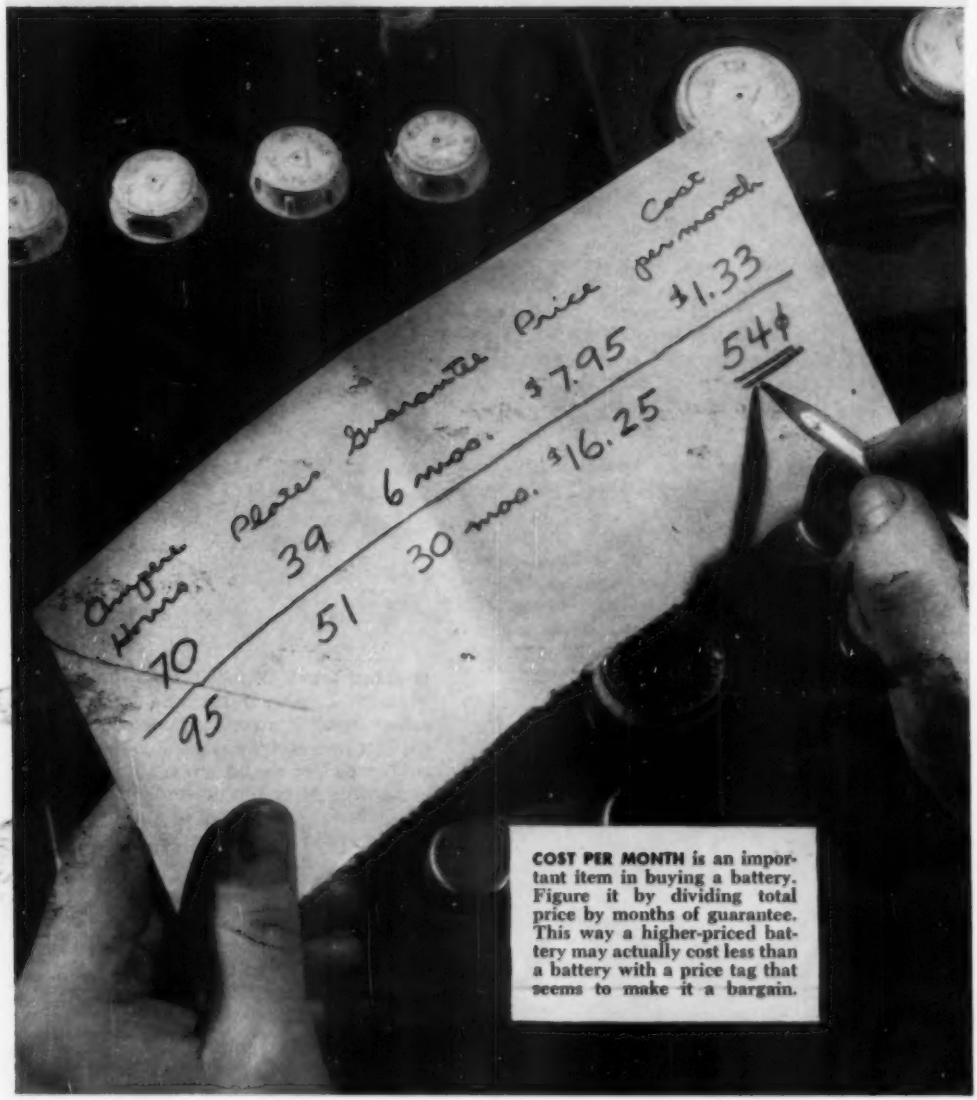
9 Hand Truck Climbs Stairs. The motor on this heavy-duty hand truck would either drive it across a floor or ramp, or lift it up a stairway step-by-step. Small rubber rollers would engage a stair tread as shown. After the driven sprockets had lifted the main wheels to stair level, the rollers would engage the next step.

The following patents *have been issued on these inventions: 1. Patent No. 2,722,064 to A. Jaffe, University Heights, Ohio; 2. No. 2,586,632 to M. Esposito, Gloversville, N. Y.; 3. No. 2,688,649 to J. Bjorksten, Madison, Wis.; 4. No. 2,739,465 to D. Soderblom, Ardmore, Okla.; 5. No. 2,737,852 to C. Porter, Center Moriches, N. Y.; 6. No. 2,783,682 to O. Swenson, Crystal Lake, Ill.; 7. No. 2,740,405 to R. Riordan, Oak Park, Ill.; 8. No. 2,799,245 to A. Ruggiero and C. De Ninne, New Rochelle, N. Y.; 9. No. 2,740,484 to J. Montana, Glendale, Calif.*

Copies of patents may be ordered, by number, from the Commissioner of Patents, Washington 25, D. C., at 25 cents each. To write to an inventor, if the address given above is insufficient, you may address him (by name and patent number) in care of the Commissioner of Patents.

How to buy

The Right Battery for Your Car



COST PER MONTH is an important item in buying a battery. Figure it by dividing total price by months of guarantee. This way a higher-priced battery may actually cost less than a battery with a price tag that seems to make it a bargain.

Do you need a new battery—or just a recharge? How much capacity does your car require? How can you figure true battery cost? Here are the facts

By Edward D. Fales Jr.

IT'S late afternoon. You're in a parking lot miles from home. Your starter groans and quits.

"Battery's shot," says the gas-station fellow, looking you in the eye.

"How much for a new one?" you ask.

He looks in a book. (Somehow you're always suspicious when a dealer goes for the book.) He says: "$37.95."

You indulge in a moment or two of verbal wrestling, but you're licked before you start and you know it. "Look," he says, "it says right here. For a 1956 Plyforlet sedan, 12 volts, 54 plates, 65 ampere hours. $37.95."

So you buy it and drive home. On the way you seem to remember paying $12 for a good battery. What became of $12 batteries? Are they still around?

Back home, you pick up a mail-order catalog. Staring you in the face is a battery with a 15-month guarantee. You suddenly remember: You drove off without your guarantee.

But what startles you is the price: in big type, $7.75. You start to blow your top. Then you see it's a six-volt battery.

Then you see something else: This little six-volt job actually costs only $5.75 because the buyer gets a $2 allowance. You got no trade-in allowance at all. (You forgot to ask for it.)

Now you're wondering: Were you "taken?" Did you, in fact, need a new battery after all? Or did yours just need charging? What *could* you have done? Here's what:

- Make sure the dealer tests the "dead" battery.
- Don't waste time looking for bargain or miracle batteries. There aren't any.
- The battery that costs most at first may actually cost less in the long run.

Take that little $7.75 battery. To begin with, that's factory price. Who goes to a factory to buy a battery? In a retail store it's $8.45.

And the seller himself tells you it will cost you 52 cents a month to use—if you spread the purchase price over the 15-month guarantee time. Right next to it he advertises a huskier six-volt job for $14.15 (factory). This one gives not 80 but 115 ampere hours; cranks at zero for 3.6 minutes. And this one has a four-year guarantee. Cost per month (if you use it four years): only 28 cents. So the $14.15 battery on a long-term basis actually costs you half as much as the $8.45 battery.

One of the big users of car batteries is the Hertz Co., which rents out more than 30,000 automobiles all over America. Hertz

How to tell whether you NEED a new battery

BEFORE you buy a new battery, you should make certain that all life has gone from the old one or is about to go. Here's how to check:

1. Test with a voltmeter. Have your serviceman prod each battery cell with a voltmeter. If the difference between the highest cell and the lowest one is .05 volts or more, the battery is nearing the end of its useful life and should be replaced.

However, if the highest cell reads less than 2.03 volts, the test should be considered doubtful. Have the battery recharged and repeat the test.

Here are two typical sets of test readings, illustrating good and bad conditions:

1st cell	2nd cell	3rd cell	Condition
2.07	2.06	2.06	OK
2.09	2.02	2.08	worn out

State of charge: To tell exactly how your readings rate, check them against this standard:

2.10 .... 100% charged (excellent)
2.07 .... 75% charged (fair)
2.03 .... 50% charged (recharge)
2.00 .... 25% charged (bad for battery)

2. Or test with a hydrometer: Have your serviceman read the specific gravity of each cell and compare the readings. If the difference between the highest and lowest cell is .050 (50 points) or more, the battery is near the end of its life and should be replaced. If highest cell reads less than 1.190, the test is doubtful (see above) and must be repeated after recharging the battery.

Typical readings:

1st cell	2nd cell	3rd cell	Condition
1.230	1.220	1.220	undercharged but OK
1.250	1.180	1.240	worn out

State of charge: Some hydrometer scales show this directly in percentage of charge. If your serviceman's does not, compare his readings with the following:

1.260 .... 100% charged (excellent)
1.230 .... 75% charged (fair)
1.200 .... 50% charged (recharge immediately)
1.170 .... 25% charged (bad; could ruin battery)
1.110 .... (discharged)

naturally has given batteries a lot of thought. Hertz's national maintenance boss, G. H. Maxwell, says:

"The best gauge of value is cost per month. If a battery sells for $18 and is guaranteed 18 months, the cost is $1 a month. If a $24 battery is guaranteed for 30 months, or a cost of 80 cents a month, it would be a far better buy . . ."

Tips: (1) Get your guarantee—in writing. (2) Register your battery immediately by sending in the date-of-purchase slip.

And know what your guarantee is. Most big makers give you a new battery if yours is found defective in 90 days or 3,000 miles (whichever happens first).

After that, you get a cost adjustment based on "units of use." A unit may be either one month or 1,000 miles. Low- and medium-priced batteries are guaranteed for from 15 to 24 units. High-priced batteries are guaranteed for 30, 36 and even 48 units. One big seller gives a flat five-year guarantee on his best battery.

Know the ampere-hour rating. Somewhere stamped on a new battery you should find a number. Let's say you use a six-volt battery. The number might be 70, and it's important.

It means that your battery, theoretically, could pour out one ampere per hour for 70 hours—it has a 70-ampere-hour capacity.

Now a new 70-a.h. battery may be just fine if you live in a mild climate, you don't load your car with power gadgets and you drive enough to keep your battery well-charged.

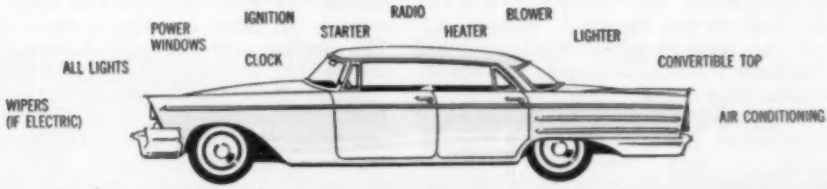
But suppose you face tough winters, use radio, heater and extra lights a lot, and drive the car mostly on short trips around town? Short trips pull a lot of power and your generator doesn't have time to put it back.

Then you want an 80- or 90-ampere-hour battery. Or you might go to 100, 105, 115 or even 120.

What about 12-volt batteries? If you have a new car and use a 12-volt job, chances are the number printed on the battery ranges between 45 and 65. That's because 12-volt batteries have lower ampere-hour capacity. (Having twice the voltage, they need less amperage.)

If you're using a 50-a.h. battery, and do mostly city driving, with quite a few

A battery must provide power for . . .



HEAVY ELECTRICAL DRAIN in a modern car could quickly kill an inadequate battery. That's why you can't risk buying a weaker battery than the one that came with the automobile. If you add air conditioning or other accessories you may need a still stronger one.

electrical accessories, you may want to go up to 55, 60, 65 or (in larger cars) 72. Price goes up with ampere hours. But so does guarantee time.

Check the cranking time. On some battery cases you will find another number next to the ampere-hour rating. This tells you how many minutes, at zero degrees F., your battery is guaranteed to turn your engine. (This is an important figure to know; if it is not printed on your battery be sure to find out what it is.)

When you turn the switch, your starter pulls out gobs of power. On a warm day, this "draw" may be 300 amperes. On a cold day, it may jump to 450 or even 650.

This demands a battery with plenty of reserve power because at zero degrees all batteries get quite feeble. (They're only 40 percent as strong as on a hot day.)

Some batteries are guaranteed to pour out 300 amps for 1.7 minutes of zero cranking—and you will find 1.7 printed on the case. One example is a 70-a.h. six-volt battery that sells for $13.85. The same maker's 100-ampere-hour battery cranks for 3.5 minutes and costs $20.45.

How many plates do you need? When you crank, the acid literally storms the lead plates in your battery. The more plate area the acid can attack in a split second, the more starting power you get.

Unfortunately, most manufacturers are quite secretive about plate area. They don't publish figures. But they do publish the number of plates.

The number of plates can fool you, however, since they aren't all the same size. Large batteries may have larger plates, but not always. Some "bargain batteries" look just as big as costlier batteries, but contain much smaller plates. Many of these batteries go into used cars.

Rather than *number* of plates, base your choice on ampere-hour capacity. This capacity varies directly with plate *area*.

What about a dry charge? Some batteries are filled with acid and water at the factory. Others aren't filled until the dealer sells them. These are called "dry-charged."

Dealers like them. Factory-filled batteries on a shelf deteriorate unless the dealer keeps charging them. But when a dealer stocks an empty battery he can forget it until you come in to buy it. Then he fills it, shoots a quick charge into it, and off you go. This takes about a half hour.

Such a battery costs a dollar or two more. But you do get a "fresh" battery. It hasn't begun to live—or age.

Never accept a partly charged battery. You pay for a full charge, no matter what kind of battery you buy. Get it. If a battery has just been taken off the charger each cell should report in at 2.12 volts or a trifle higher. If it's been standing a few hours, cells should test evenly at 2.10 volts.

A hydrometer test should show a specific gravity reading of 1.260 at 80° F. (Be sure your dealer corrects for temperature. He has a correction table.)

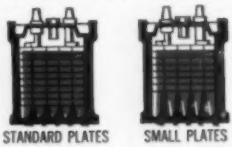
To buy a partly charged battery is dangerous. If you rush off on a long trip, your generator may bring it up all right. Otherwise, it may remain partly charged for weeks in your garage, or on short trips around town—and that may take weeks off its life. (It is particularly important to have a dry-charged battery fully charged when your dealer puts it in your car.)

Are 12-volt batteries more reliable? No. The 12-volt is no more, no less, reliable than the six-volt. Maybe you've

heard that 12-volt batteries sometimes quit in dense, slow traffic. That's not the fault of the batteries. Today's 12-volt cars have lots of electric gadgets. The battery drain, in stop-go-idle traffic, is something terrific. Your generator as a rule doesn't cut in until 18 m.p.h. or thereabouts. So when you creep through traffic you "starve" your battery. This is the biggest single reason for buying enough ampere-hour reserve.

You may ask: But since a 12-volt battery has only about half the ampere-hour reserve, won't it quit sooner than a six-volt? No. That's because, with twice the voltage behind it, it is capable of the same total amount of work. Remember: Work depends on voltage times amperage.

Recent improvements: Battery cases are stronger, less apt to crack or warp. Some are said to have 50 percent more impact resistance than a few seasons back. Many low-cost cases are made of a bituminous composition or plastic; many higher-cost cases are made of hard rubber. All are molded in one piece, with tops sealed on.



BATTERY SIZE is no assurance that you get your money's worth. Some may look just as big, yet give you less plate area because of false bottom.

Plates are stronger, last longer than a few years ago. All plate separators used to be made of wood, and many still are. But overcharging can char wood, and so separators of plastic, porous rubber and fiber are being widely used. Sometimes glass-fiber mats are used between separators and plates. These help hold the lead "active materials" in place so they won't slough off the plates and weaken plate-power.

Some fill plugs are improved: to prevent overfilling and make filling easier.

The electrolytic fluid is a weaker acid mixture than formerly. Lately, manufacturers have found that batteries perform just as well with a fluid of only 1.260 specific gravity (1.260 times as heavy as water). In older batteries it was 1.280. The weaker acid lets your battery live longer.

What about "special alloy" batteries? It's worth knowing that all battery plates contain a sneaky sort of metal called antimony. Antimony is needed to beef up the plates and put backbone in them when they're molded. But antimony is a traitor in a way. It has a bad habit of slipping out of the positive plate and going over to the negative plate, taking with it tiny charges of your valuable electricity. Result: Your battery runs down slowly when not in use.

Lately all manufacturers have found they can cut down on the amount of antimony, and some have gone a step further. To seal the antimony in the plates, various alloys are now used as "jailers." One of these is silver cobalt.

How effective are the new alloys? There is no general agreement yet among manufacturers. Some makers think they help a good deal; other makers doubt it.

What about the nickel-cadmium battery? Just relax. It does a fine job in planes and locomotives. But it costs four or five times as much as your lead-acid battery. Chrysler offered it for a while as an option on some high-priced cars, but later discontinued the option. Reason: "It costs too much."

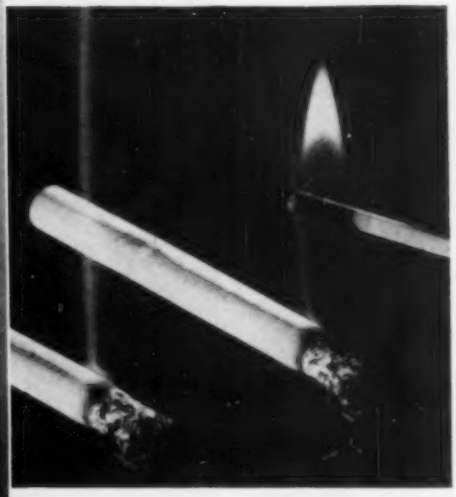
The Sonotone Corp., which makes it in the U. S., isn't aiming at the auto market. Some experts say the battery works wonders in sub-zero climates.

But even pioneers like the Sonotone people say that under *most* conditions you're well off with the right package of plain old lead and acid. END

Next Month: Why Kill a New Battery?

You can buy a new battery every year. Or you can buy that same new one every three years. What you spend this way depends largely on how you take care of that all-important energy-storage box. Next month's Popular Science will feature another revealing article about batteries. It will tell you how to make a new battery last many, many months longer.

New Home Incinerators Burn Their Own Smoke



Hold a match in a cigarette's smoke; the smoke disappears. The same principle of two-stage burning makes new indoor trash burners truly smokeless

THE home incinerator has been brought in from the back yard. After more than six years of laboratory research, new smoke-free and odorless incinerators have been perfected for use inside homes. Makers are introducing them this month.

The new models are trim little gas burners. You install one in the basement, utility room, even the kitchen. They have been designed for acceptance in communities that now restrict or forbid the use of conventional incinerators.

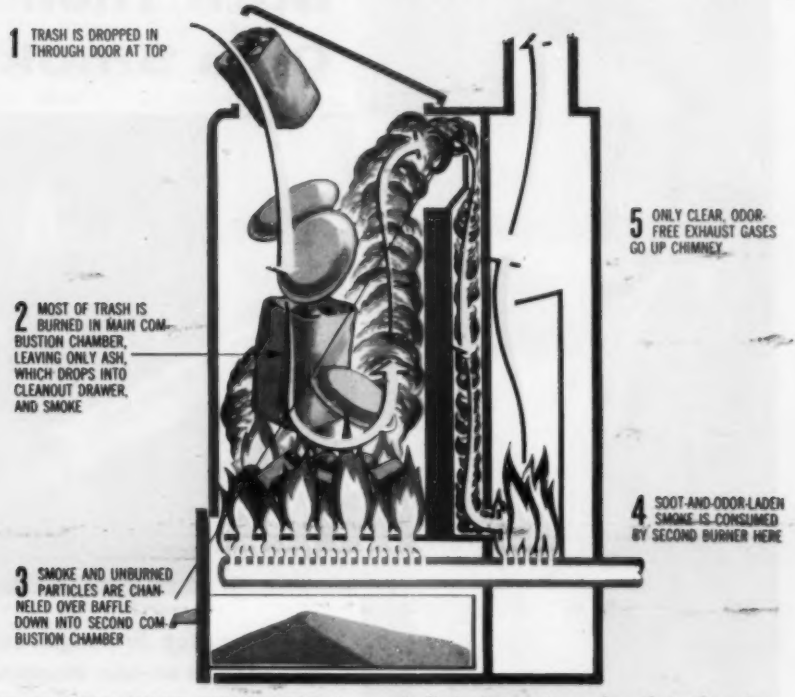
They'll burn anything except metal and glass. Bones, sweepings, paper and wet and dry garbage are reduced to a white powdery ash. Spread on flower beds, this makes a fine mulch, say experts.

Afterburner eliminates smoke. Conventional incinerators have a single combustion chamber that does not always fully burn all of the waste. Sometimes unburned particles are blown up the chimney, producing smoke and odors.

The new models work on the 100-percent combustion principle long used in big commercial incinerators. They have a main combustion chamber, plus a second chamber—the afterburner. Any unburned particles that get away from the first burner are completely consumed by the second one. Result: no smoke or odor to go up the chimney.

They're tested. To meet anti-smog requirements of many communities, the American Gas Association set up stiff

How the new two-stage home incinerators work



SECRET OF CLEAN WASTE INCINERATION is the second burning that consumes particles and eliminates noxious odors that otherwise would escape up the chimney as "smoke."

standards for each manufacturer to meet.

To date, seven new makes have full AGA approval or are expected to have it soon. They are Bowser (Smogmaster), Calcinator, Caloric, Locke Stove (Warm Morning), Majestic, Martin Stamping, and Waste King.

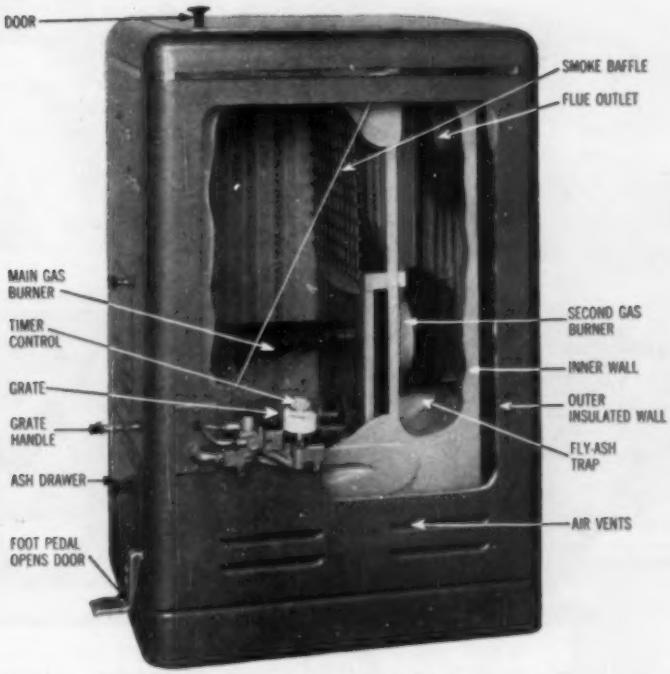
Sales are expected to hit 200,000 a year almost immediately, eventually climb to a steady 400,000 a year. (Sales of conventional gas incinerators have reached, all told, a relatively puny 400,000 over the past 10 years.)

They're inexpensive. The new incinerators will sell for about $175 for one with a 1½-bushel capacity, up to $225 for two-bushel models. By home-appliance standards, this is a modest price, say the makers, for a machine that will do a quick, clean job of removing up to 75 percent of daily household waste. Other types of disposers get rid of as little as 15 percent, they argue, because they're limited to food waste only.

Operating costs run about three cents a day, or $1 a month. Installation may cost from $20 to $50, though some dealers are expected to toss it in free to encourage sales. You need two hookups, a flue vent to your chimney and a connection to the gas supply. Any type of gas will do—manufactured, natural or bottled.

Most chimneys are big enough to take on an incinerator along with the furnace, but they must be of the Class A type (masonry or factory-built). Class B chim-

what's new



INSIDE A NEW TRASH BURNER. It took the industry six years to design the right combination of burners, baffles and flame control to insure 100-percent combustion.

neys, a low-cost variety found mainly in the South and West, won't withstand the high-temperature incinerator exhaust.

For economy and appearance, it's best to keep the connection to the chimney as short as possible, which means placing the incinerator against or near it. If you don't have a chimney or it isn't easily accessible, you can buy a Class A prefab chimney for about $75 to $100.

They're automatic. To start one of the new models, you simply drop in a load and set an automatic timer according to the type of waste. The wetter it is the longer it takes. Most loads are completely consumed in one to four hours.

At the end of the preset interval, the burner shuts itself off, so that it can be run unattended at any time during the day or night or when you're away. The fine ash that forms needs to be cleaned out only about once a week.

For safety, all gas incinerators have an automatic valve that shuts off the gas if the pilot light goes out. The makers also claim that they stay cold to the touch because of a heavy jacket of insulation, so there's no danger of burns to young children. Several models have treadle-operated doors that leave hands free.

To be sure of getting a good unit, see that it is clearly labeled "smokeless and odorless" and carries the AGA approval. Some new models are similar to the old ones on the outside—but not on the inside. —*A. M. Watkins.*

what's new

for your car

Nearest thing to radar for cars is ***an automatic parking alarm*** that sounds your horn whenever another car parks too close or when you have to "feel" your own way into a tight space. The projecting feeler, shown above, can be mounted on either the front or rear bumper and is connected by a single wire to your horn. Pressure on the feeler trips a switch that sets off a continuing blast until pressure is released. Product Associates sells the alarm for $14.95 . . . A "wraparound view" to match today's wraparound car windows is the aim of a ***wide-vision curved mirror*** that clips to your present rear-view mirror. The Sta-Dri accessory is 12″ long . . . If you don't go for the dash-mounted mirrors on some cars, Yankee Metal Products offers an ***overhead mirror bracket*** that lets you remount the mirror above the windshield . . . A new line of Koehler battery spotlights have an added safety feature: ***a flashing red extension light***, as shown at left. It plugs into the battery spotlight and can be placed up to 10 feet away to warn approaching motorists. The white spotlight has a half-mile range, adjustable focus, comes in three models for about $9 to $15 . . . A special ***muffler-sealing cement*** is available

from the Magic Iron Cement Co. for patching rust leaks and loose joints . . . You don't have to move your car or jack it up to put on the ***quickly mounted tire chains*** at right. Two bent-wire arms built into the sides let you slip the chains up under the fender and over the wheel. Then you simply reach behind the wheel with a long hook to fasten the inside. The outside is latched in the conventional way, and spreaders pull the chains taut so the inner hook can't come undone. The Campbell chains come to fit all wheel sizes for about $15 to $18, and the maker even throws in a pair of plastic sleeve protectors.

Signs that summer isn't far off: ***Screens for car windows*** keep out bugs when you stop to camp, eat or catnap. Made by the Car Bed Co., they have self-adhering edges. You just press them on, or roll them up for storage in the glove compartment . . . If you like the sun and fresh air enough to spend $300 to $500, you can have a ***sliding roof*** installed in your car, station wagon (right) or even cabin boat. Two styles, metal and fabric, are made by Golde Body Parts, and you can even have your choice of manual or automatic electric operation . . . Less luxurious, but useful, is a ***car-wash mitt*** that keeps your hands dry while you wipe on the suds. It's sold by F.P.I., Inc. for $1.98 and has a pocket in the back that holds detergent powder.

for your leisure hours

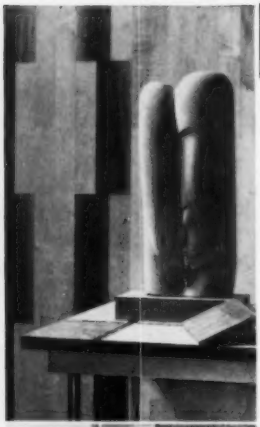
Two new uses for small, disposable tanks of gas: One is a ***gas-fired percolator*** that assures hot coffee on camping trips. Made by Blu-Burn-R Products, it will perk up to 12 hours before you hook on a new tank . . . Another is a Kerr ***portable air horn***, also powered by a disposable gas tank, that you can carry in a boat. Price: $9.95.

Prefab summer cabins are being offered by two makers. Pan-Abode puts out a log-cabin type with the claim that you can assemble it in as little as an hour, without any nails. The smallest of several sizes is 12′ by 17′ for $800. Arnold-Dain uses a system of 3′ wall panels for any size plan from small tool sheds and pool cabanas to large summer homes. Prices range from $350 to $1,000.

Two ***Sputnik-inspired items:*** A 45-r.p.m. record of the satellite's actual radio beep, available for $1 from Mooney-Rowan. There's also a ***satellite plotter***, for $1.95 from Library of Science, that shows when the little moons will pass over any given spot for best viewing . . . A new ***all-transistor short-wave portable radio*** that works on nine ordinary flashlight batteries is made by Zenith for $250. A hinged handle snaps up to expose a 3′ telescoping antenna, and eight bands give a tuning range from 540 kc to 22.4 mc. A log chart lists foreign stations and the hours of best reception.

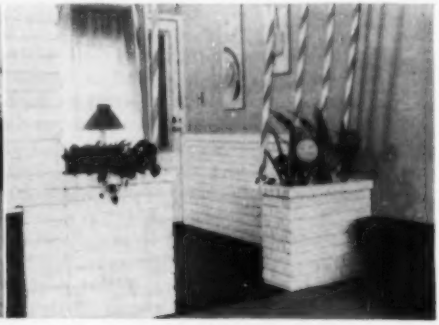
More new products on the next page

what's new for your home



Flooring that you can also use as wall paneling now comes in striking prematched patterns of contrasting hardwoods. The planks are 10′ and 12′ long for floors, 8′ for walls (left), so they span most rooms without the cutting and fitting of odd lengths. Made by Miller Brothers, they're also double standard flooring width to cut nailing time in half . . . ***Slimmer TV sets,*** only 10″ deep, are on the way from Sylvania. The trick? They let the flatter new 110° picture tube project 4″ out front to pare away still more cabinet depth.

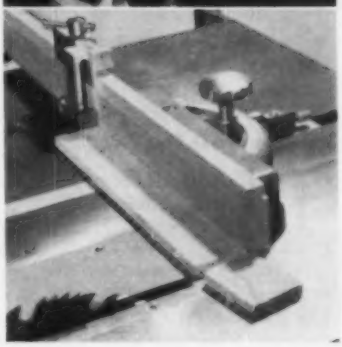
Revolution in cooking utensils: Electric skillets, grills, griddles and pans now have a single, removable power control to cut cost and permit complete dunking in water for cleaning. Sunbeam, Dominion and Universal are among the trend-setters . . . Tappan's ***new counter-top range*** comes with a built-in motor that powers—count 'em—a food blender, mixer, meat grinder, fruit juicer and knife sharpener. Who says men have all the power tools? . . . Only thing that isn't self-powered is a ***non-motorized portable dishwasher*** (center, left) that uses faucet pressure alone to spin a rotating water spray. The 11-pound Chico unit is said to clean eating ware for a family of five in about six minutes. Price: $59.95 . . . ***Breath sweeteners for air conditioners*** are now available in the form of odor-trapping carbon filters that fit directly behind the dust filter. They're made in four standard dust-filter sizes by Conner Engineering . . . ***Inexpensive brick veneer*** can be made by pouring ordinary plaster-of-Paris into plastic molds (below, left). When hard, the "bricks" are put on with tile cement and painted (right). Two molds, for standard or Roman face-brick, are sold by the Official Decorator Mold Co. for $2.98.



for more information:

Here's where to write if you can't get any item listed above: **R. W. Anderson Co.,** *1110 W. 68th St., Los Angeles 44;* **Arnold-Dain Corp.,** *Rt. 6, Mahopac, N. Y.;* **Blu-Burn-R Products,** *Highway 69 S., Monroe, Wis.;* **Campbell Chain Co.,** *York, Pa.;* **Car Bed Co.,** *P. O. Box 213, Panama City, Fla.;* **Chico General Products,** *525 Market St., San Francisco;* **Conner Engineering Corp.,** *Danbury, Conn.;* **Diamond Expansion Bolt Co.,** *500 North Ave., Garwood, N. J.;* **Dominion Electric Corp.,** *Mansfield, Ohio;* **F.P.I., Inc.,** *336 3rd Ave., NYC 10;* **Golde Body Parts,** *6636 Charlevoix Ave., Detroit;* **Kerr Chemicals,** *P. O. Box 89, Park Ridge, Ill.;* **Koehler Mfg. Co.,** *Marlborough, Mass.;* **Library of Science,** *59 4th Ave., NYC 3;* **Magic Iron Cement Co.,** *5403 Bower Ave., Cleveland;* **Masterline Products,** *6715 Hollywood Blvd.,*

for the home shop



You can clamp a ***new miter guide*** right to the board you're sawing by adjusting two sliding plates. The Twix guide can be set to any angle up to 45° in both directions, fits all stock up to 8″ wide, and sells for $2 . . . ***A built-in wire stripper*** now comes on Wirestripper screwdrivers. You just pull a wire through a hole in the handle to remove the insulation.

Interchangeable jaws for pliers let you set or remove rivets, crimp metal and punch holes. They're made by Time Saver Tools in many types to fit cam-action pliers . . . Critical saw settings are quickly made with an ***adjustable table-saw stop*** that slides on a rail fastened to the miter gauge. You first lock the stop in approximate position, then adjust a screw feed for pinpoint accuracy. The stop swings up out of the way without disturbing the setting. R. W. Anderson sells it for $3.50.

for the home handyman

You can start a power mower with an ***electric-drill attachment*** sold by Rotex. A toothed cylinder, chucked in the drill, spins a matching toothed nut screwed permanently to the mower's shaft. As the mower picks up speed, the drill is automatically disengaged by a ratchet action . . . It had to come: ***A four-color ball-point pen*** for $4 by Masterline.

Two extra-short expansion anchors, made by Diamond and by Molly, are designed to attach things to hollow-core doors and over narrow furring strips where space is shallow . . . A new Plug-Rite ***neon tester*** tells instantly whether an appliance, radio or power tool is correctly plugged in, to avoid a "hot chassis" that can cause shocks. If the light glows, you reverse the plug in the wall . . . For the handywoman: ***pre-measured soap packets*** by Reynolds Metals. Toss 'em in a washer—the packets dissolve.

Sheldon Gallager

Hollywood, Calif.; **Miller Brothers Co.,** *Johnson City, Tenn.;* **Molly Corp.,** *Reading, Pa.;* **Mooney-Rowan Publications,** *Severna Park, Md.;* **Official Decorator Mold Co.,** *96 Flamingo Rd., Levittown, N. Y.;* **Pan-Abode, Inc.,** *Kennydale, Wash.;* **Plug-Rite Inc.,** *3232 Olive St., St. Louis, Mo.;* **Product Associates,** *1046 S. Olive, Los Angeles;* **Reynolds Metals Co.,** *3842 Georgia St., Gary, Ind.;* **Rotex Sales Co.,** *8305 Sovereign Row, Dallas, Tex.;* **Sta-Dri Products,** *147-47 6th Ave., Whitestone, N. Y.;* **Sunbeam Corp.,** *5600 Roosevelt Rd., Chicago;* **Sylvania Electric Products,** *1740 Broadway, NYC 19;* **Tappan Stove Co.,** *Mansfield, Ohio;* **Time Saver Tool Corp.,** *7116 Madison Ave., Hammond, Ind.;* **Twix Mfg. Co.,** *40-09 21st St., Long Island City, N. Y.;* **(Universal) Landers, Frary & Clark,** *New Britain, Conn.;* **Wirestripper Tools, Inc.,** *Glen Head, N. Y.;* **Yankee Metal Products,** *Norwalk, Conn.;* **Zenith Radio Corp.,** *Chicago.*

Pick one you like, and build it in one evening:

4 Bargain Tables from Flush Doors

By Darrell Huff

THE advantages of making a dining or coffee table from a flush door have multiplied as the prices of these handsome doors have dwindled.

You can put together any of the four smart tables shown, using a hollow-core door, in an evening. The door will cost as little as $6 to $10 in colorful Philippine mahogany, perhaps 50 percent more in blond birch. Add a few dollars for underpinnings and edging—and you have a really big table at a bargain price.

Home and Shop

The designs are easily modified in height. Make a dining table or writing desk 28″ to 30″ high, typewriter desk 26″, coffee table about 15″. Choose a door 36″ wide if you're making a dining table, one anywhere from a width of 24″ up for a coffee table, serving table or desk.

Nearly all doors are 80″ long. You can trim one down for a shorter table. Or you can cut it into two or three pieces for a set of small tables.

For a utility or outdoor table, or one to be enameled, you may find a door made with hardboard surfaces for $3 or $4. A door with one side scratched or gouged is often available at a bargain—and who sees the underside of a table?

Directions for making legs for the tables shown are based on using a select grade of construction lumber from the lumberyard. If you make them of hardwood instead, you can reduce these dimensions slightly. For instance, instead of two-by-fours use hardwood about 1½″ by 3½″.

A clear finish will preserve the natural beauty of the attractive woods used in

1. Early-American Trestle

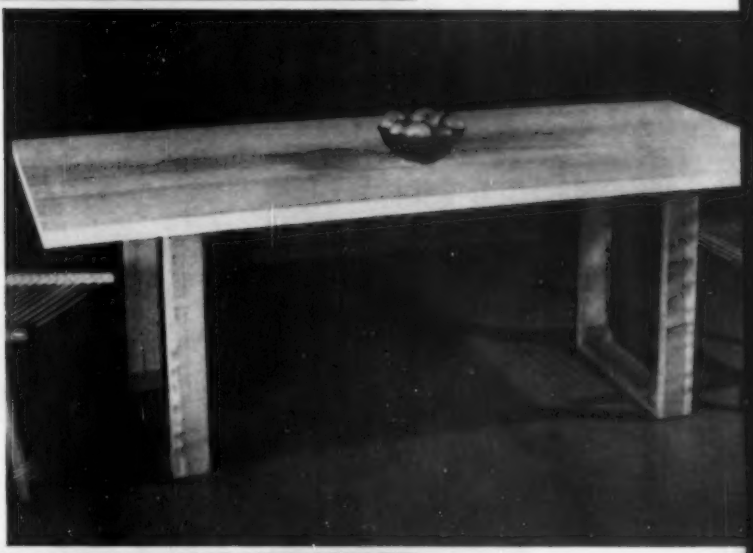
Combining modern simplicity with traditional shape and construction, this big table uses the full expanse of a 36″-by-80″ flush door for roomy dining.

2. Splay-Leg Table

Each pair of legs is taper-ripped from a single piece of standard lumber. The taper gives a neat, slanted effect without the use of angle mounts.

3. Hollow-Square Table

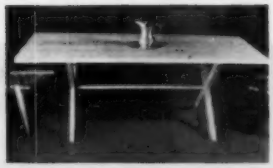
A pair of open square frames support this attractive dining table and provide solid cross braces. Wedge-shaped corner blocks reinforce the two frames.



4. V-Leg Table

This simple plan enables you to build a table in an hour or so. The legs are made by joining two pieces of lumber to form a V-shaped trough.

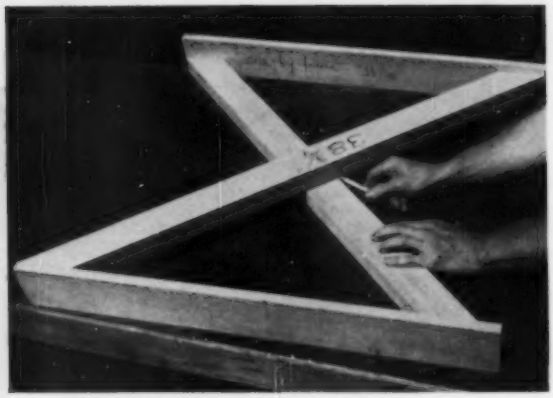
For construction details, see the next three pages



1.

Materials for the Early-American Trestle

36" x 80" door
14′ of 2" x 3" lumber
6′ of 1" x 4" lumber
4′ closet pole, 1"-1½" dia.
4 No. 8 oval-head screws, 1¼"
16 No. 8 flathead screws, 1½"



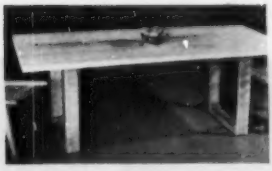
CUT four 38¾" legs with 45° ends from two-by-three; two 31 3/16" braces from one-by-four. Cross legs between braces, mark half-laps and cut them. Bore each *inner* leg for pole.

2.

Materials for the Splay-Leg Table

36" x 80" door
5′ of 2" x 8" lumber
4′ of 2" x 6" lumber
16 No. 12 flathead screws, 2"

CUT the two-by-six into two 22½" crossbraces. Saw each two-by-eight into two 28½" pieces and draw a diagonal line ending 1½" from opposite corners. Rip along this line to make legs.

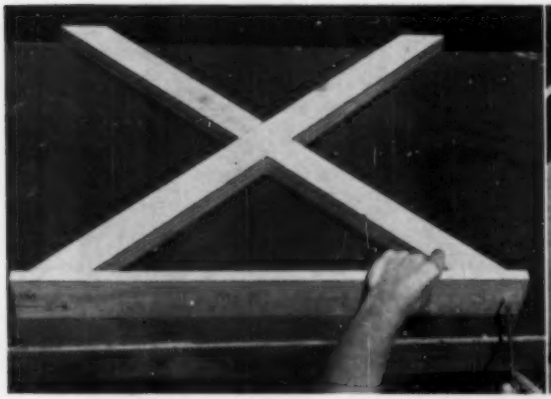


3.

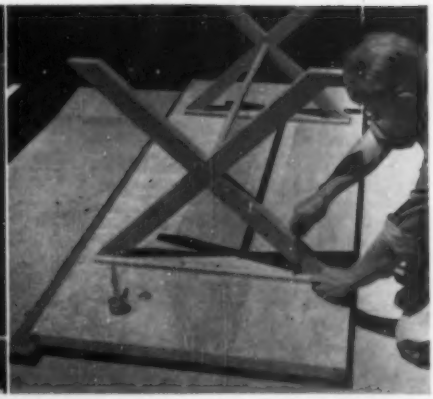
Materials for the Hollow-Square Table

36" x 80" door
2 lengths, 10′ each, 2" x 4" lumber
28 No. 12 flathead screws, 2"

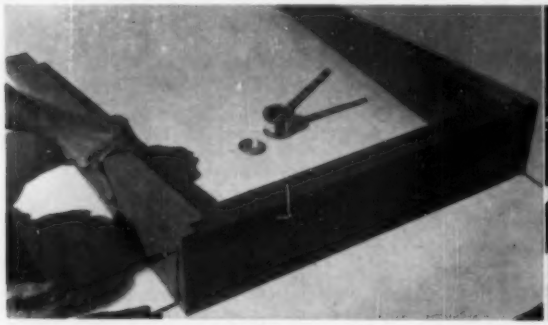
CUT each two-by-four into two 22½" lengths and two 28½" lengths. Rabbet all ends and make two identical rectangular frames, using glue and two screws at each rabbeted corner.



FIT half-lapped legs to crossbraces and fasten the top ends with glue and 1½" flathead screws to make trestles. *Then* secure the lap joints with glue and 1¼" oval-head screws.

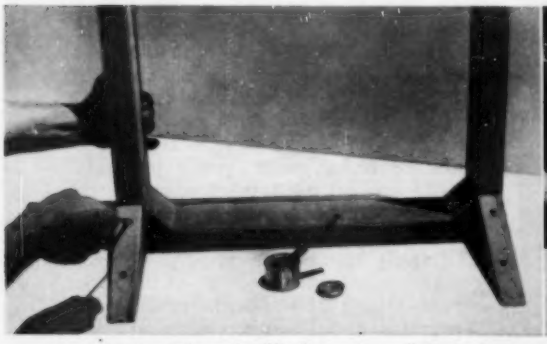


ASSEMBLE the trestles to the underside of the door after gluing the pole between them. Drill four holes for screws in each crossbrace, spread glue on meeting surfaces and fasten.

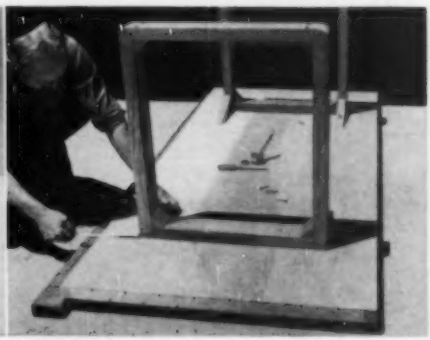


FIT rabbets cut in the upper leg ends to matching rabbets cut in the crossbraces, and fasten them with glue and two screws at each joint. Countersink the screw heads in the legs.

ASSEMBLE the table. Place the legs 12" to 16" from the ends of the door, square across it and an equal distance from both edges. Fasten each brace with glue and four screws.



FIT two triangular blocks cut from leftover two-by-four and glue them to the inside corners of the frames. Drive one screw through each triangle to pull it up against the frame.



ASSEMBLE the frames to the door with glue and four screws. Screws alone would not hold in the thin veneer. Round off the bottom of each square as shown. (Please turn the page.)

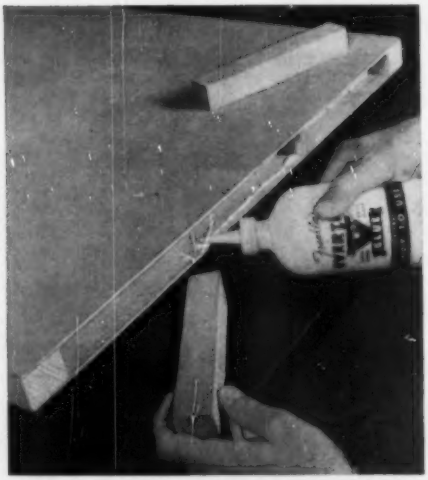
4.

Materials for the V-Leg Table

36" x 80" door
10' of 2" x 12" softwood (only 5' for 15"-high coffee table)
12" x 14" piece of 1" lumber

CUT the two-by-twelve into four 28" lengths and rip 1⅝" off two of them to make two troughs with equal sides when butted. Saw diagonally across the 1" lumber for the triangles.

FIT a triangle to one end of each trough and glue it. When dry, center the troughs 8" from the door's ends and glue them. Pile on books to apply pressure while the glue sets.



FLUSH DOORS sawed in two to make similar tables, probably will have open space at ends. Fill these by cutting blocks of scrap lumber and gluing them flush with the veneer edges.

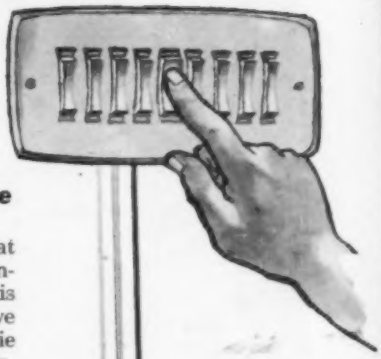
flush doors. One of the wipe-on sealers can be applied so quickly with a soft cloth that you really can finish your table in a single evening—and use it the next morning.

How to cut a flush door. When you saw a flush door in two to make smaller tables, the cut ends will probably have open hollows. Fill them by cutting blocks from scrap lumber and gluing them in flush with the veneer surfaces. Plane them smooth after the glue dries.

If you're building a table to grace your dining or living room, you'll probably want to conceal the lumber edges of the door with strips of matching veneer, now widely available in lumberyards.

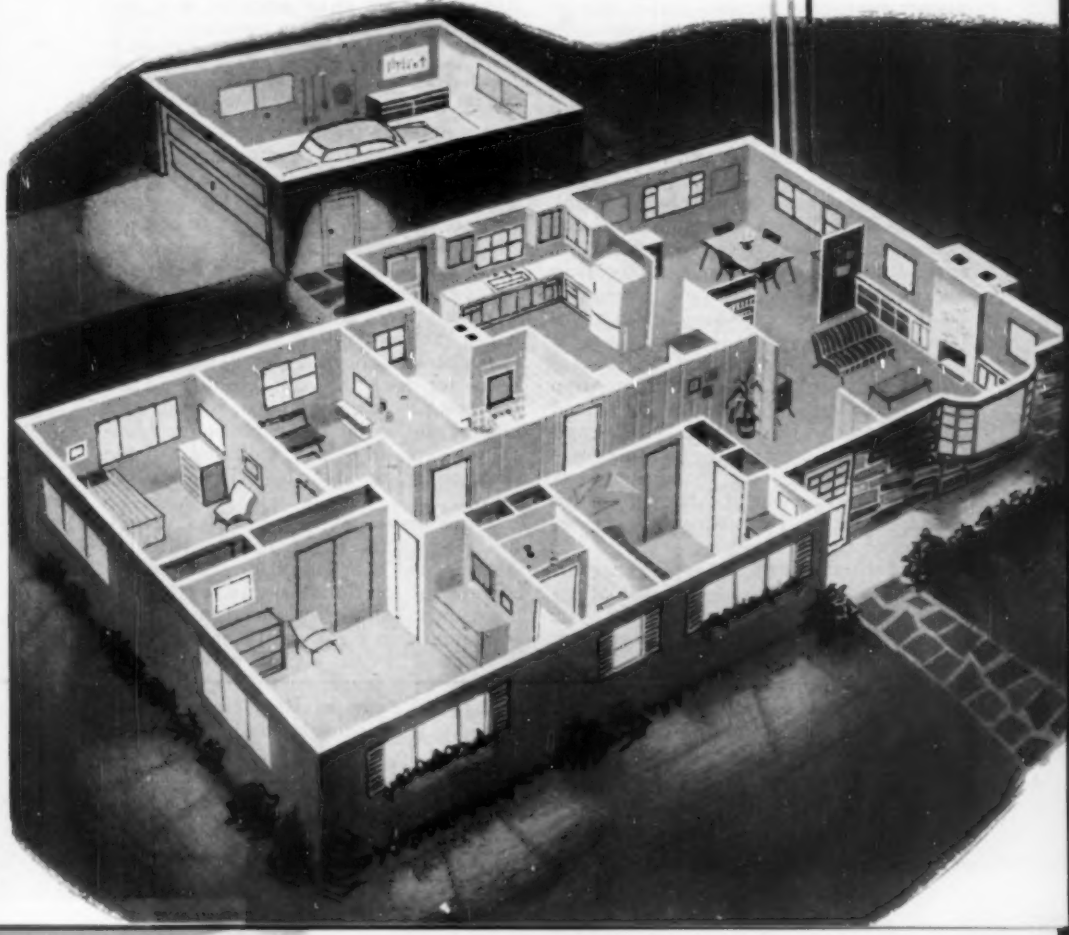
To apply the veneer, brush a coat of contact cement onto the edge of the door and the veneer strip. Let the cement dry 30 minutes, apply another coat and let it dry 30 minutes. Place the veneer exactly in position and press firmly. Trim flush with a plane and sanding block. **END**

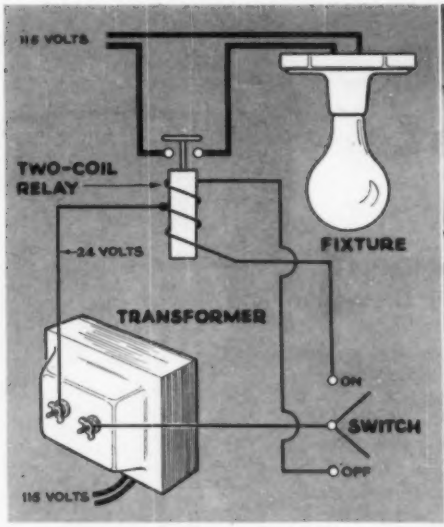
How to Light Your Home with Remote Switches



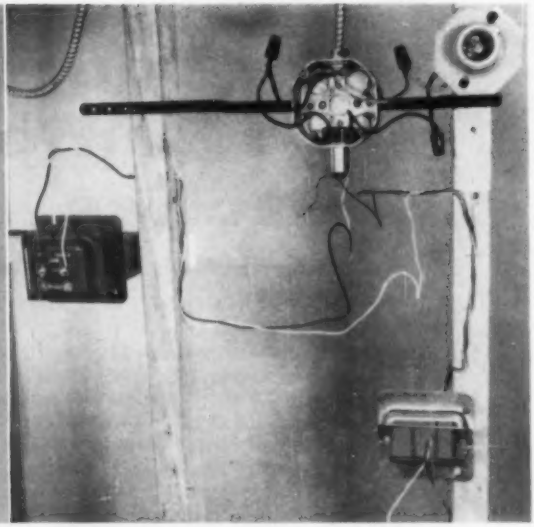
Simple relays put you in control of lights and appliances from any part of the house

REMOTE switching—the house-wiring system that puts any number of electric circuits under your control from as many switch locations as you wish—is well past the luxury stage. Today you can buy inexpensive and easy-to-install components for such a system and tie them into your present 115-volt circuits. Once they're installed, trim little relays will open or close these circuits whenever you nudge them with a shot of 24-volt juice. The





REMOTE-SWITCHING CIRCUIT is shown above in schematic drawing. A transformer supplies the 24-volt current needed to operate a two-coil relay which opens or closes a 115-volt house circuit, depending upon which coil is energized by a two-position, momentary wall switch.



OUTLET-MOUNTED RELAY MOCK-UP. Here, each circuit-opening and -closing relay is set in the outlet box of one of the fixtures it controls. In most home installations of this type, a single transformer does the job, supplying low-voltage current for all of the relays in the house.

systems are amazingly versatile—you'll find many ways to use them.

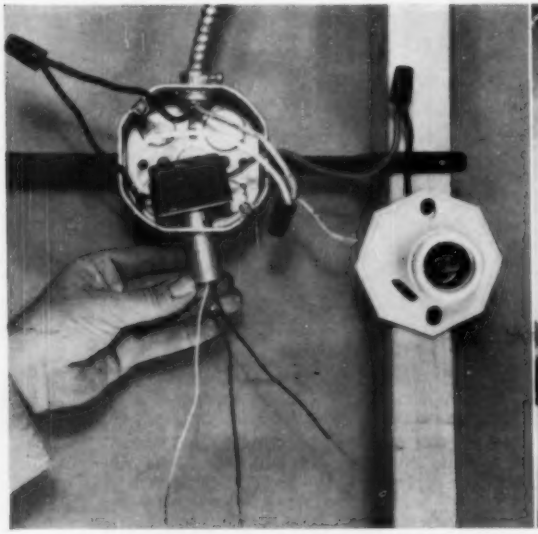
If you go for a complete house installation, you'll have a central control station, usually located in your bedroom, from which you can open and close any one of eight independent circuits, or all eight simultaneously. One circuit might floodlight your yard, illuminate a post lamp, and turn on the porch lights. Another might project a path of lights from your front hall through the living and dining rooms to the kitchen. A third and fourth could determine the lighting level in the living room—one by turning on a pleasing arrangement of table and bridge lamps; the other, by cutting in the overheads and wall fixtures.

This central control station—a checker-upper that lets you douse the last of the lights when you go to bed, or flood your home with illumination in an emergency—is only part of the deal.

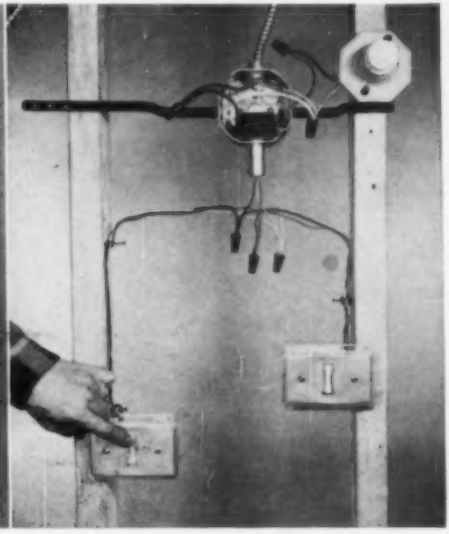
There's no limit to the number of control stations you can have. For that path of light between the front hall and kitchen, for example, you'd place other control switches close to the front and back doors, and at one or two intermediate spots.

What makes this modern switching system so flexible is its use of secondary, low-voltage circuits to operate relays that open and close the 115-volt light and appliance circuits. Its basic parts are: (1) a *transformer*, which reduces ordinary house current to the low-voltage juice that operates the relays; (2) a *two-coil relay* for each 115-volt circuit; (3) a *two-position, momentary switch* at each control station; and (4) *low-voltage conductor wires* to deliver the output of the transformer, through the switches, to the relays.

Transformer. With a single exception, the manufacturers of remote-switching systems use one 24-volt transformer to energize all of the relays in a complete house installation. This transformer can be mounted in a standard 4"-square box, with its 115-volt pigtail wires spliced directly to a house circuit. On the low-voltage side, one of its pigtails is connected to wires going to the wall switches; the other, to wires leading to the relays.



VARIATION of an outlet-mounted relay system uses a combination relay and miniature transformer for each circuit, eliminating the need for long wire connections to a common transformer. In all multiple-switching systems, wires are color-coded for easy circuitry.



MULTIPLE SWITCHING, no matter what system you use, lets you control both single- and multiple-fixture circuits from as many switch locations as you wish, as well as from a master station. It's just a matter of tying a low-voltage, three-wire line from each switch to the relay.

The only exception to this common-transformer setup (Remcon's) incorporates a miniature transformer built into the base of each relay, eliminating long, low-voltage power leads.

With both systems, the transformer provides a safety feature. Its limited output protects the wiring against overloads, even in the case of a short circuit. Thus no fuses are required. And because the switches draw current only momentarily, there is no drain on the transformer.

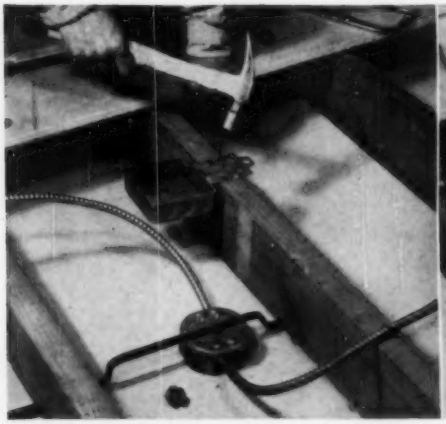
Relays. The relays used with either a common transformer or with the mini-transformers have pigtail wires for connections to the 115-volt circuit. At the other end of each relay is a tubular shank that fits into any ½″ knockout hole in a fixture box.

Three color-coded, low-voltage pigtails project from the shank for switch connections. Wires attached to the red pigtail go to the *ON* terminals of wall switches; those connected to the black pigtail go to *OFF* terminals. The third, or white pigtail, on relays that do not have a built-in transformer, is attached to one of the transformer leads (the other transformer lead goes to the common terminals of the wall switches). If you use mini-transformer relays, wires go directly from the white pigtail to the common switch terminals.

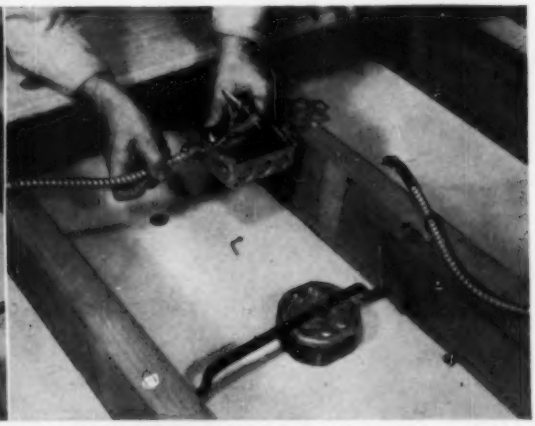
Wire. Plastic-coated, three-conductor wire is used in the circuitry between the switches and relays. With a common-transformer hookup, you also need two-conductor wire for the transformer leads. You can either buy this two- and three-conductor wire already made up, or twist separate, insulated wires loosely together. No conduits or raceways are required.

Wall switches. Small, two-position switches are mounted either singly or in groups on cover plates that attach to conventional gem boxes. You can also buy a rotary selector switch which you simply turn to the desired house-circuit number and actuate by pushing a single switch button. Another gem-box fitting that is particularly useful is a receptacle plate with three outlets, one of which is marked for wall-switch control (you wire the other two in the conventional way, for control at the plugged-in appliances or

One way to solve a relay-mounting problem



ACCESS TO OUTLET BOXES in an unfloored attic is easy. But a center stud in this ceiling fixture box leaves no room for a relay. In such cases, nail a new fixture box with ½" knockouts to the top of a nearby ceiling joist.



DISCONNECT EXISTING POWER-FEED and switch-leg cables from the old outlet box, and run the power feed to the new one through a knockout. Tape up the end of the old switch-leg cable—you no longer have any use for it.

What the basic parts cost

PART		MANUFACTURER'S NUMBER	LIST PRICE*
Bryant and General Electric			
TRANSFORMER		RT-1	$ 8.00
RELAY		RR-2	3.30
SWITCHES	FLUSH	RFS-1	.39
	SURFACE	RSS-1	.69
	MASTER	RMS-2	6.40
WALL PLATES		RP-1, -2, -3, -4**	.27
2-CONDUCTOR WIRE		per 1,000 ft.	15.10
3-CONDUCTOR WIRE		per 1,000 ft.	21.20
Remcon			
RELAY (BUILT-IN TRANSFORMER)		R-115	$ 4.20
SWITCHES	SINGLE	S-1	.45
	MASTER	MS-9C	9.00
WALL PLATES (INCLUDING BRACKETS)		PL-1, -2, -3, -4, -5**	.40
Square D			
RELAY		1070-C	$ 3.60
SWITCHES	SINGLE	1091-C	.50
	MASTER	1109-S	6.90

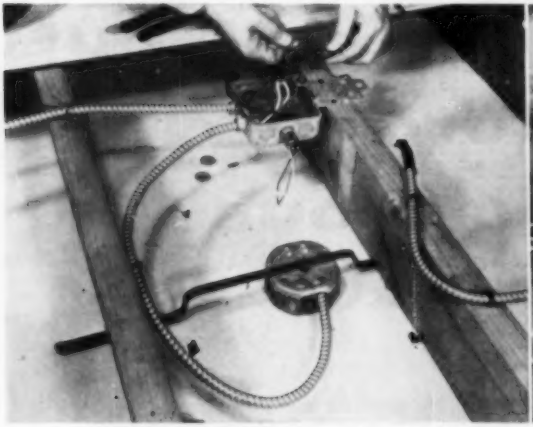
*Subject to change.
**Numeral indicates number of switch openings.

lamps). All remote-control switches have color-coded terminals, to simplify the wiring for you.

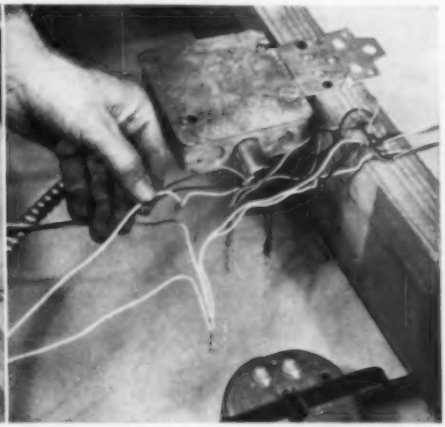
Which system? Before you install any remote-control switching system, determine which fixtures are best controlled singly, and which in groups. Remember that you can also control any single fixture in a group circuit, if you install a relay at each fixture box.

Look over your house, too, with a view to special installation problems. It may be that one or another hookup, or combination of hookups, can simplify the job. If you are building a new home, running low-voltage switch circuits to remote points is not difficult, and you might go for a layout in which all relays are mounted in a single gang box, close to a common transformer.

In an old house, however, this method could present a difficult wire-threading problem. Here you might find that placing a relay in a junction box close to each 115-volt circuit is the best solution. Or the relays could be mounted in existing fixture boxes, or tied into the high-voltage switch legs in the gem boxes. The accompanying illustrations show typical examples of all such installations. Among them should be one that is just right for you.—*Ralph Treves.*

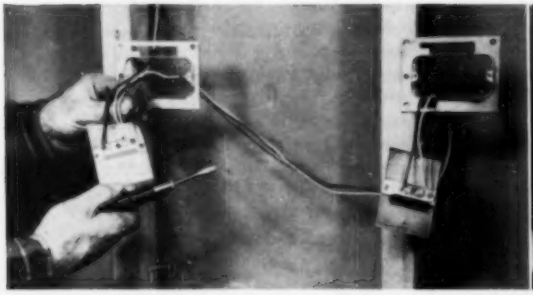


RUN A CABLE from the new box to the fixture connections in the old one. Install the relay and make soldered connections, secured with tape or wire nuts. House current will now pass to the fixture through the relay.



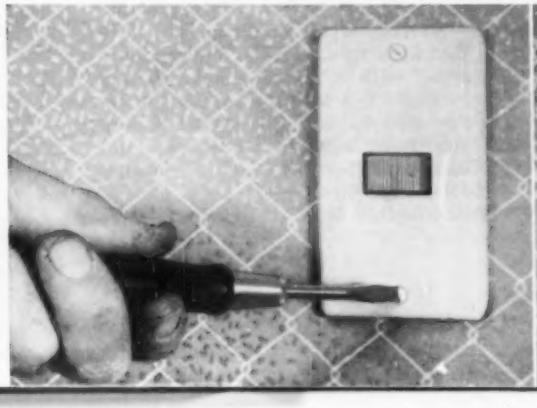
MATCH COLOR-CODED LOW-VOLTAGE PIGTAILS with three-wire leads going to the wall switches. Here again, use soldered connections with tape or wire nuts. You can either buy three-conductor wire, or use independent wires.

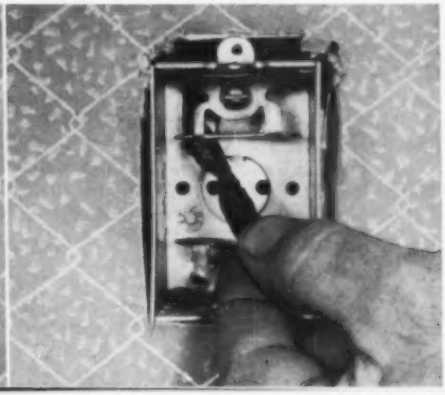
2 ways to install switches



HOW TO WIRE CONTROL SWITCHES in parallel, along one lead, is shown in mock-up. Wires are continuous, with insulation stripped at each color-coded screw connection. The flush-mount switch shown consists of a plaster ring, a single switch and wall plate. Other assemblies come with as many as nine switches, or a nine-circuit rotary selector, on one plate.

DESIGNED TO FIT, some remote-control switches will go in conventional gem boxes. If the box is big enough you can also mount the relay in it, instead of in a fixture box (connect the high-voltage pigtails to ends of switch-leg wires). If you mount the relay in a fixture box, disconnect the old switch leg at both ends and push it out of the knockouts. END





A new formula answers the big question:

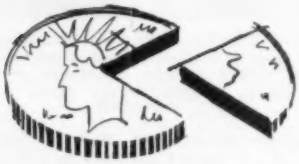
What Can You Afford to Pay for a House?

By John L. Springer

BIG changes in living standards, taxes and credit conditions in the past decade have forced bankers to figure out a new way of estimating what you can pay for a house.

The best advice used to be that you could afford one costing about twice your annual earnings. The emphasis was on the price of the house.

The new formula disregards the price



tag on the house. Instead, you're advised that you can afford housing *expenses,* figured by the month, of about one-fourth your *monthly* earnings before income taxes, social security and other deductions.

Here's an example of why a new formula was needed:

Joe and Bill each earn $6,000 a year. Each bought a $12,000 house. Joe lives in an established section on the edge of town. He pays 15 cents' bus fare to get to work. Local schools are built and paid for, so his taxes are comparatively low. He had a refrigerator, washer and dryer—all paid for—before he moved in. He pays 4½% interest on his mortgage.

Bill lives farther out, in a new suburb. He pays about $10 a month more for taxes, another $15 extra for commutation. After he took title to his house, he bought a refrigerator, washer and dryer on a two-year instaliment contract. Costs: another $35 a month. He pays 5½% interest on his mortgage—about $8 a month more than his friend.

Joe meets his house costs comfortably. Bill sweats it out the first of every month. Yet, according to the *old* formula, each could "afford" his house.

The up-to-date way of figuring, could have kept Bill in the clear. This method would have told him that he was about to get beyond his depth financially. Since the new approach pins down all your housing costs on a monthly basis like rent, it's made to order for today's home seekers, dedicated buyers on the installment plan.

"We make thousands of mortgages every year," says Andrew Wilson of the Dime Savings Bank of Brooklyn. "We find that most new home buyers are more concerned with what they have to pay every month than with the builder's price. They're used to paying rent and paying off installment loans by the month, and it's easiest for them to visualize housing costs the same way."

This monthly basis of figuring is now

used by the Veterans Administration and Federal Housing Administration—which insure mortgages—and private lenders such as savings banks. Here's one version:

You take *all* expenses related to your house. This list includes your regular monthly outlay for taxes, interest and payment to reduce the mortgage; commutation to work (and to schools if your youngsters use public transportation); heating; sewer assessment; maintenance; water bills (if you buy your water); garbage collection (if you pay for that separately); and payments on appliances that used to be luxuries but are becoming musts in a modern home—items like dishwasher, garbage-disposal unit, exhaust fan.

Listing your expenses this way forces you to consider variables that drastically affect overall housing costs. These variables include:

• How much money you put down: Every thousand dollars you add to your down payment reduces by about $6.60 the amount you have to pay every month in interest and to amortize a 20-year mortgage at 5%. If you have a large chunk of savings, you might be able to afford a house priced thousands of dollars higher than the average man in your income range could handle. By making a larger down payment, you lower your actual monthly payments to the bank.

It is not recommended, however, that you strap yourself, leaving no cash backlog for emergencies. And don't forget

Beginning a new series:

Before You Buy or Build

Buying a house, or building a house, is a serious step for any family—often the biggest financial transaction in a man's life. Yet many take this step with less pause, less weighing of pros and cons, less checking of values, than when purchasing a car.

Yet a home, and the land upon which it stands, can't be checked out in five minutes as you might a car—or traded in every year or so for a new model. To most people it means permanency. The chances are that you will be paying for it, and living with it, for many years. The pitfalls facing a prospective home buyer are many, from a falsely attractive price to defects in materials and construction that will show up with the regularity of the mortgage payments.

With this article POPULAR SCIENCE *begins a fact-packed, authoritative series aimed to help you choose a house that will be not a headache but a home. Next month: "Buying a Development House."*

moving-in expenses or that you may need to buy some new furniture for the new house.

• Terms of the mortgage: Some mortgage moneylenders may give you 30 years to pay, and charge only 5% interest. Other banks want 5½% and give only 20 years. The homeowner with mortgage A obviously pays less per month than the holder of mortgage B.

• Taxes: They vary widely from community to community. Buy a $15,000 house in one suburb of New York and your tax bill may run as high as $45 a month. A few miles away the monthly tax bill on a house of the same price may be only $10. As a homeowner, you'll get part of the tax back; in filing your income-tax return, you can deduct your local property tax as well as all interest payments on your mortgage. It makes a tidy sum.

That's why, here, you figure your gross income, before deductions, in computing what you can pay for a house. And other payments you make, for Social Security and pension plans, are of course really savings that you would otherwise budget for.

• Utility costs: It's strange but true, real-estate men told me, but new home buyers, used to apartment living, often forget that they must now pay for water (unless there is a well) and heat. Those items are paid for by landlords, and tenants forget that they exist.

• Time-payment plans: How you pay for your home appliances may enable you to carry a higher-priced house.

Say you have a choice of House A versus House B. The first is $15,000—but that price includes appliances such as washer, dryer, refrigerator, range—$2,000 worth of "extras." Amortization payments on a 20-year mortgage at 5% interest come to about $99 a month.

House B, without extras, is $13,000. Mortgage payments are about $85.50. After you move in, you need those appliances and buy them on the installment plan. But instead of 20 years to pay, as on a mortgage, you get two years. Moreover, you pay 9% or 10%—not 5%—on the typical installment-buying loan. Every month you must dig up about $87 for appliances alone. Add that to the $85.50 going out on the house, and for quite a while you pay $73.50 more a month than the owner of House A.

• Commutation costs: Bargain houses miles from town sometimes become mighty expensive when you add what it costs to get to work. Commutation can nick you anywhere from $6 to $60 a month. It should be figured as a housing cost.

• Age of the house: A newly built home generally does not need much upkeep for the first few years. After four or five years, however, you'd better allow two percent of the price of the house annually for such items as repairs, painting, replacement of worn-out equipment.

The new formula means that if you're a $500-a-month man you can spend $125 a month on housing expenses. The average man in the $1,000-a-month class could spend $250 without feeling hurt. The cost of the house itself becomes only one factor (a most important factor, to be sure) in figuring how much you can afford.

Say you earn $600 a month, or $7,200 a year. You may find that you can't carry a house with a $12,000 price tag (well under twice your annual earnings) because other payments boost your monthly cost far above $150. On the other hand, low taxes, low commuting cost and a long-term mortgage may enable you to handle a $16,000 house with ease.

Not a rigid formula: Some authorities would argue that it's too conservative—that the average family could spend more on a house without straining the family

Figure all the bites in computing monthly housing cost

BIGGEST BITE is taken by the bank with mortgage-interest and amortization payments. Then come the smaller bites that represent the cost of day-by-day living. If all these add up to about a fourth of your monthly earnings, you are buying within your means.

How to Figure What You Can Pay for a House

First figure your income

Monthly earnings (complete before income tax and other deductions)	_____
Value of employer's pension contributions (if any) *	_____
Value of other fringe benefits (if any) *	_____
Life insurance	_____
Health insurance	_____
_____	_____
_____	_____

*(Check with your employer about these, and their value to you)

Total Effective Monthly Income	_____
Divide by four to get approximate amount available for monthly housing costs. Result:	_____

Now figure your monthly housing costs

Monthly payment covering amortization and interest on mortgage	_____
All local taxes on property (per month)	_____
Fire insurance on property	_____
Commutation	_____
Average monthly heat and water bills (estimate)	_____
Sewer assessment per month (if any)	_____
Garbage collection per month (if paid separately)	_____
Monthly installment-plan payments on appliances that become part of the house (dishwasher, clothes washer, dryer, refrigerator, range, garbage-disposal unit, kitchen and attic fans)	_____
Maintenance (allow 1/12 of one percent of total sales price if house is less than 5 years old; 1/6 of one percent if it is older)	_____
Total Monthly Housing Costs (Total monthly housing costs should approximate ¼ of the total effective monthly income)	_____

Moving-out day when a mortgage is foreclosed is something the bank wants no more than you.

budget. If the house you want comes too high, but it is important enough to you, sacrifices can be made in other ways.

A great deal, too, depends on your income bracket and your personal tastes in spending. If you're in a high bracket, you can splurge on housing and cut down on other luxuries—theaters, travel, entertaining—which others on your income level can afford. If you have a houseful of youngsters, you may spend less on shelter, more on food, clothes and school bills.

Other factors that might influence how closely you follow the formula include your own earning prospects and your town's tax outlook. If you're in a job where raises are reasonably to be expected, or have a business that is growing, you might go a little strong on housing now on the theory that earnings will catch up. But if your income is pretty well fixed—you're a civil-service employee, say—you'd better apply the formula strictly.

In some communities all basic improvements—schools, roads, town halls—are in and paid for. Taxes won't rise rapidly or unexpectedly as will those where improvements must still be made. Check on the school system. In a growing community this is the most important factor in anticipating tax rises. If your house is in a stable tax area, you might go a little beyond the one-quarter figure.

The bank's attitude: The main point in considering what you can pay for a house is to avoid having your mortgage foreclosed. You can help protect yourself by giving whoever underwrites your mortgage a true, complete picture of your financial condition.

Despite what the old nickel movies featured in their melodramas, bankers get no fun out of kicking you out and grabbing your home. Even if a banker had a heart of granite, he wouldn't want to do it. It's bad public relations, and state laws often clutter foreclosures with red tape that makes the proceedings more expensive than they're worth.

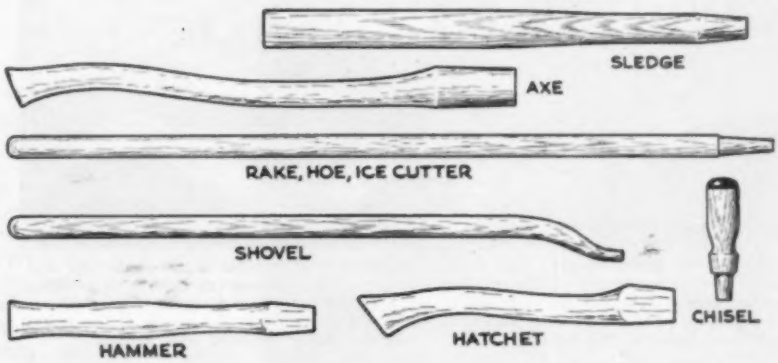
Most lending institutions don't include certain kinds of income in estimating your ability to pay. For instance, you're married, childless, and your wife works. If she's under 40, most bankers won't consider her earnings as regular income. They reason that she might have children and quit work at any time.

If you follow the formula outlined above, the law of averages says you'll be able to meet your house expenses comfortably. Surveys by the Federal Housing Administration show that the typical home buyer spends 19.5% of his total earnings for housing expenses, including utilities, maintenance and mortgage payments. When you add an allowance for commutation and home equipment, the total comes to about a quarter of monthly earnings—the formula figure. END

Add this to your Fix-It File. It'll help you maintain the tools that keep your home in order. A tool with a loose, cracked or splintered handle is a hazard. Most tools can outlast several handles; most replacements are easy.

Next Month: Window shades.

Popular Science Fix-It File



A HANDLE FOR ALMOST ANY TOOL can be bought, but take the old handle along to help you find a match, and expect to do some trimming with a plane or rasp for a snug fit.

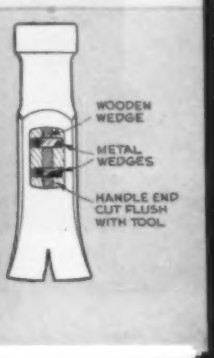
How to fit a new hammer handle

SAW OFF THE BROKEN HANDLE close to the head of the tool. Procedure is much the same for hammer, hatchet, axe or sledge. With the tool held in the vise, try to tap the end of the handle out of the eye.

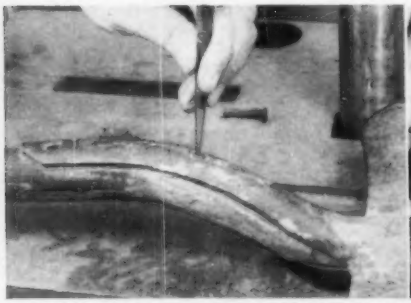
SHAPE THE END of the handle with a plane or wood rasp to make it fit the eye. Cut a vertical saw kerf about 1½" deep in the end. Drive the handle into the tool's eye until it protrudes at the other end.

DRILL SEVERAL HOLES in the wood to break it up if you can't drive it out in one piece. (Use a metal-cutting drill in case it should bite into the metal wedges.) What's left after drilling should come out easily.

USE THREE WEDGES (some dealers include them free, others charge a few cents apiece). Drive a wooden one into the saw cut to expand the handle sideways, trim flush with tool, then drive two metal wedges across it.

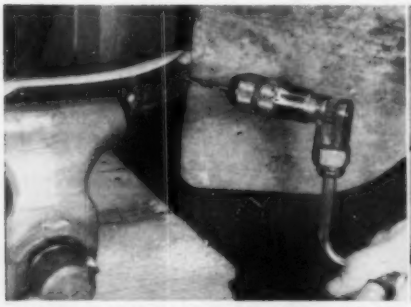


How to rehandle a shovel



CENTERPUNCH THE RIVET HEADS, drill them off, and drive the rivets out to remove the old handle. Use a metal-cutting drill about half the diameter of the rivet head to avoid enlarging rivet holes in the ferrule.

SELECT A NEW HANDLE to match the size and shape of the old one as closely as possible (replacements also come with "D" handles). Shape the end to fit the curve of the metal ferrule. Make frequent trial fittings.

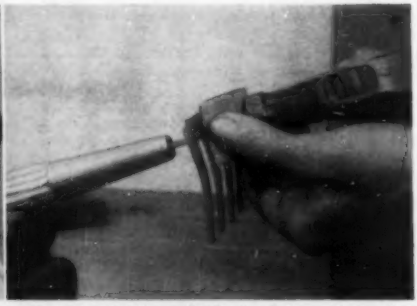


CLAMP THE FERRULE on the handle and hold parts together in a vise. Using the holes in the ferrule as guides, drill one hole through the handle and insert a rivet to hold the position. Then drill the second hole.

PEEN THE RIVETS OVER on the ferrule, using the vise anvil to back up the hammer blows. Hammer out any kinks in the ferrule to make edges snug against the handle. Hammer out dents or bent edges in the shovel.

How to install tapered-end handles

SOCKET FERRULES are common on long-handled garden tools and woodworking chisels. A screw will secure the handle of the garden tool above. The chisel handle, driven into the socket, is held by the taper only.

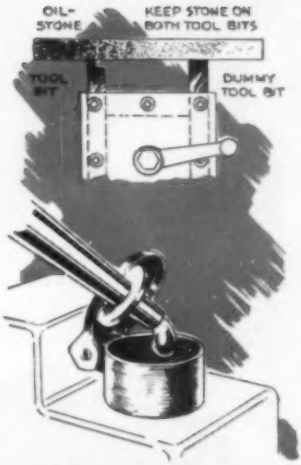


POINTED TANG, which is driven into the handle to expand the wood against a tapered shell, is found on many garden tools. Some replacement handles come with a new metal shell, but save the old one until you're sure.

The POPULAR SCIENCE Shop Notebook

Clean power-tool tables regularly for smooth operation. Remove dirt, gum and grease with lacquer thinner, which cleans and dries quickly. Then apply paste wax to the metal surface and rub it to a high polish. This treatment will produce a sleek surface that lessens friction and decreases the pressure you must apply to move work over it, thus reducing the danger of hand slippage. The wax will also prevent corrosion and keep your tools looking bright and new.—*R. J. De Cristoforo, Los Altos Hills, Calif.*

To get a straight cutting face on a narrow tool bit, place a dummy bit about 2″ away from it in the tool-post turret or bench vise and elevate it to the same plane. Lay an oilstone on both tool bits and work it back and forth across them. The long bearing surface of the two bits keeps the stone from rocking.—*Frank LaSaracina, New York City.*



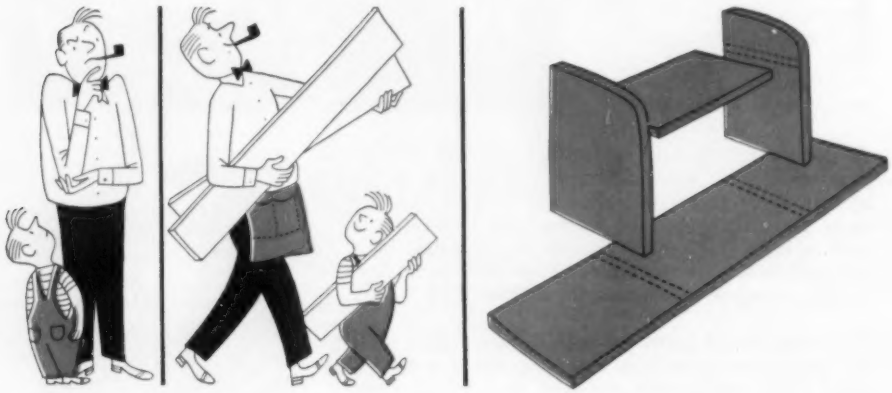
To remove dried paint spots from your hands (usually discovered *after* you wash up) apply a drop of your wife's nail-polish remover and let it stand on each spot for a few minutes. The remover will soften the dried paint, and you can easily wipe it off.—*M. Robert Beasley, Jackson, Mich.*

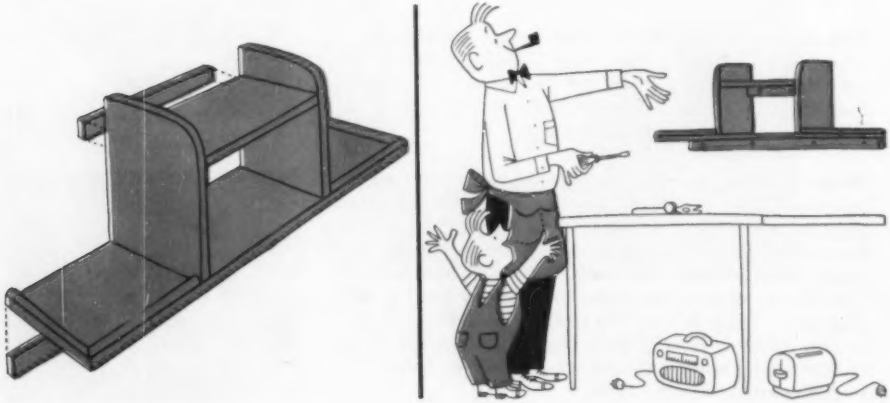
Flip up the covers of oil cups with a small washer soldered on an oil can's spout about ¼″ from the tip. With the washer holding the cover back, you'll find the tip in the right position to deliver oil to the cup, making oiling a one-hand job.

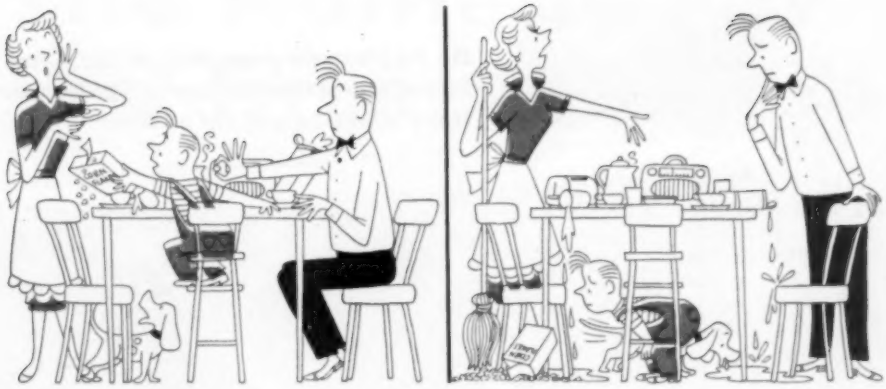
When cutting threads in a lathe, the position of the tool bit is critical. You can get on-the-nose settings with a centering gauge made from two collars beveled 30° and mounted on a mandrel held between centers. Slip the collars on the mandrel so that the beveled edges come together to form a 60° V groove. Then adjust the cutting tool until it fits in this groove. It will fit perfectly *only* when it is square to the work and also at the proper height.—*H. J. Gerber, Stillwater, Okla.*

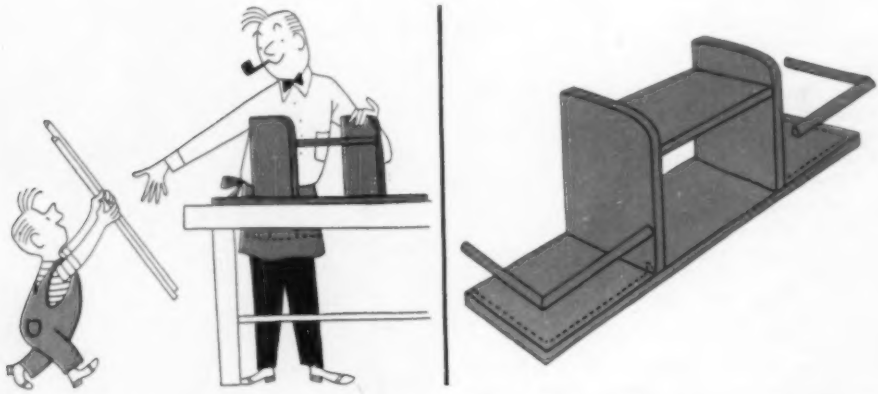
Wordless Workshop

By Roy Doty
and Bebe Morrison









Next Month: A lighted telephone pad for easy note-taking

Hi-Fi and Electronics

Do jiggles and pops mar picture and sound reception in your neighborhood? Here's how to get rid of them

By Jack Foster

"*ANCHORS aweigh, my boys, anchors aweigh,*" I sang lustily, if a bit off key, while running a sanding disk over a boat hull, my current weekend project.

"Stop that noise!" It was my wife shouting from the back porch. "Do you hear me, Jack?"

"Yes, my dear. Is it all right if I just hum?"

"You can yodel your head off," Madge said, venturing through a drizzle to the garage where I was working. A smile took the sting out of her words. "Your motor's causing the trouble, not you. It's coming in fine on TV. Mother and I prefer something more entertaining."

"Not TV interference again?" I protested, snapping off the rotary sander. "That's why I moved the shop out here. What do you want me to do, go underground?"

"No, dear, but you might try hand-sanding . . ."

"What?"

"Never mind, just be sure you don't use the portable saw, either. That comes in on every TV set in the neighborhood."

Madge is given to exaggeration. It's just that when Mrs. Perkins across the street squawks, it sounds like the whole neighborhood.

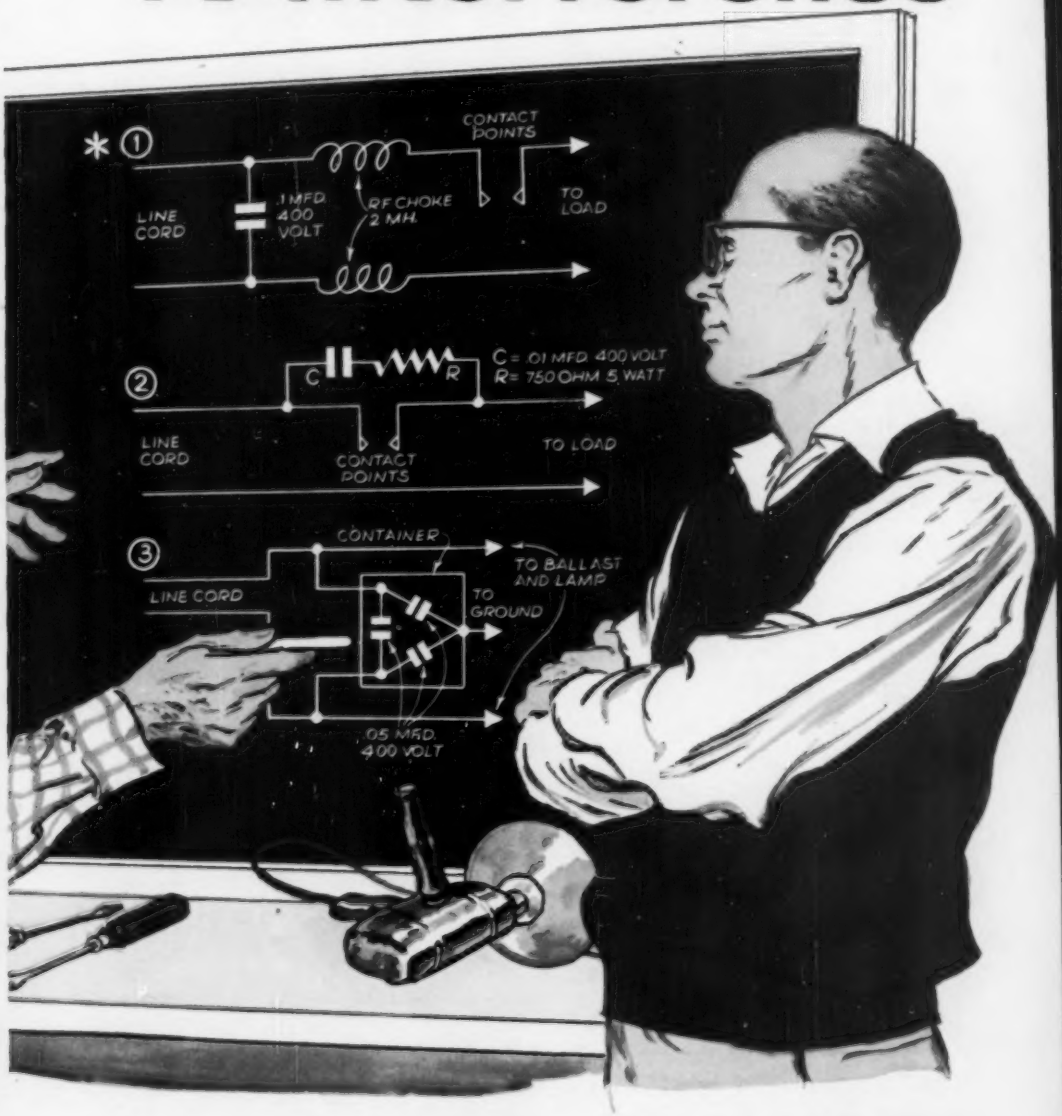
"Maybe you could find some nice, quiet gluing to do," she suggested sweetly and ran back into the house.

Since I had promised Madge that my power tools would not interfere with TV, I had no real comeback. I decided to take

***What the circuits on the blackboard mean**

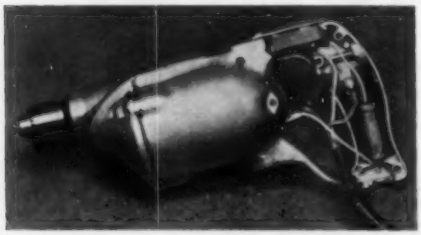
Circuit No. 1 shows a filter for such low-power devices as shavers and doorbells. The size of choke limits the power that can be handled. RF chokes of various current ratings are sold by radio-parts stores. Use 400-volt paper or mica condensers for all filters. Circuit No. 2 is the preferred filter for low-power equipment requiring installation across contact points within the appliance. No. 3 is for fluorescent lamps up to 60 watts. Filter should be installed in the lamp housing near the ballast. Don't use large-capacity condensers.

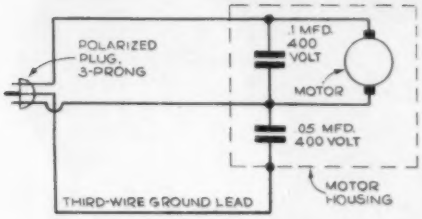
The Remedy for TV Interference



"Filters properly used will do the trick," said Cam Evans, rapidly sketching circuits on his chalkboard.

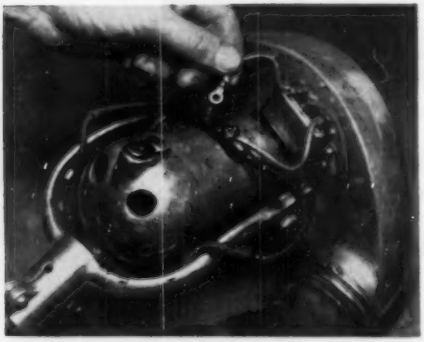
For metal-housed power tools

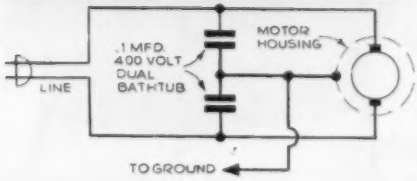




INSIDE THE HANDLE is the best place for power-tool filters. If space is cramped try the new midget condensers. Insulate condenser and leads so that they cannot short against frame. Use a ground lead. These condensers are suitable for all motor-driven home appliances.

For external mounting





READY-MADE FILTER UNITS are provided by metal-cased "bathtub" condensers. Dual unit shown here filters both sides of the line. Use a ground lead to the motor housing. Connecting condensers to frame may create a shock hazard if exposed metal is not properly grounded.

my troubles to my electrically minded neighbor, Cam Evans. I found him in his basement workshop.

"About Mrs. Perkins," Cam said when I had unloaded my problem, "she has an indoor antenna, making her set more sensitive to interference because of its weak signal strength. A filter or two should make everyone happy."

Plug-in filters. "It's Mrs. Perkins who needs a filter to keep her from interfering," I said irritably. Then, "As a matter of fact, Cam, I have been thinking of putting a plug-in filter on my TV."

"I don't know, Jack; they only filter the power that's feeding the set."

"So what? You're not trying to tell me that electrical impulses from a power tool can be picked up by a TV antenna?"

"Over a short distance, yes," said Cam. "A brush-type motor can generate a pretty strong signal. And with the power line for an antenna, it's a cinch to be picked up by a TV antenna close by."

"How about a filter at the shop outlet?"

"Might help in mild cases," he said. "A filter at the motor is best, though."

"But look, Cam," I argued, "a filter at the receptacle would isolate interference from the power line."

"Sure," he agreed. "But you still won't be doing anything about the motor cord, and that can radiate enough signal to foul up TV reception."

I should have known better than to argue. Cam hasn't spent years trouble-shooting for the local power company without learning the answers.

Our talk was interrupted by Bud Nolan, Cam's teen-age shadow who aspires to become an electrical wizard. He was holding a small radio in one hand.

"Hi, Cam. Hi, Mr. Foster," he called, waving with his free hand. "Not butting in, am I?"

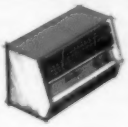
"You are," said Cam. "But genius has its privileges, so get it off your chest."

"Okay. Listen to this." He put the tiny radio on a bench and plugged it in. "Built it with my own little soldering iron," he said proudly. As music came on to a background of uneven popping, Bud's smile turned to a frown. "Darn those beeping space satellites," he said.

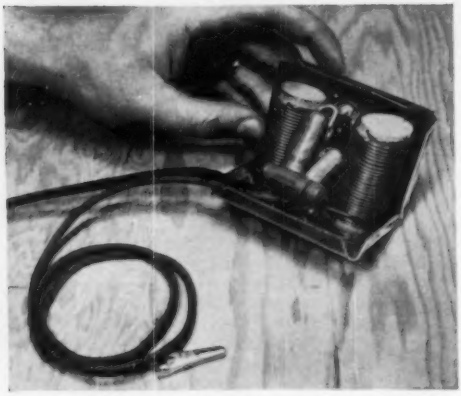
"Guess again, Bud," said Cam.

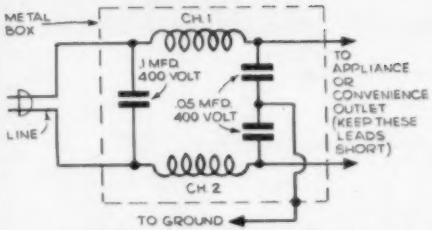
"I know. I was only kidding." Bud glanced at the overhead fluorescent lamp. "It isn't the light or a motor. They cause

Where to Look for TV and Radio Interference and What to Do About It

Symptom	Probable Cause	Remedy
Rasping noises in sound; dots and streaks in TV picture	**BRUSH-TYPE MOTORS** Portable power tools, vacuum cleaners, food mixers, sewing machines	Clean commutator, install new brushes, put in condenser-type filter. CAUTION: Use no larger than .05 mfd. condenser to ground. Be sure all exposed metal housings are securely grounded with separate ground wire
Rasping or popping noises; dots and streaks. Picture may flip. Usually occurs during starting cycle only	 **INDUCTION-TYPE MOTORS** Air conditioners, refrigerators, furnace blowers, washing machines, dryers	Bond motor to frame, install direct ground, check for loose connections, check starting mechanism
Clicks, popping noises in sound. Picture may flip in weak signal areas	**THERMOSTATICALLY CONTROLLED HEATING DEVICES** Electric irons, coffee pots, skillets, heaters, blankets, pads	Check line cord and connections. Install choke-type filter at outlet. Put in condenser-resistor filter across contact points of thermostat
Roar with distinct low-pitched hum when furnace comes on. Streaks and flipping in TV picture	**OIL-BURNER IGNITER**	Bond motor, burner and furnace. Install choke-and-condenser filter on igniter
Frying noise. Salt-and-pepper effect in TV picture of nearby sets using indoor antennas	**DOORBELL**	Install resistor-condenser filter across contacts at bell. Replace transformer if defective
One or two dark, snaky lines across the picture, usually on only one channel	**OLD-STYLE TUNGSTEN LAMP**	Replace with modern bulb
Popping or crackling noise in AM radios. Flashes and streaks in TV picture	**BELT STATIC** Any belt-driven device	Bond machines together with heavy conductor and ground. Apply thin film of graphite to belt
Rasping or frying noises in AM radios. Overall sandpaper effect in TV picture	**FLUORESCENT LIGHTS**	Replace starter and fluorescent tube. Install condenser-type filter in lamp housing. Use special commercial filter in severe cases

Combination choke-and-condenser filter fits in box





EVEN STUBBORN CASES of TVI will usually be cured by this combination choke-and-condenser filter. House in a separate box. Chokes 1 and 2 in circuit above consist of 18′ of No. 20 enameled wire wound around empty thread spools. Filter is suitable for appliances requiring not more than 500 watts. If the power demand is greater, use larger size wire.

a steady buzzing." He scratched his head. "Got it! Mrs. Cam is using one of her automatic electric gadgets."

"Good try," Cam agreed. "Some thermostat-controlled appliances do cause radio popping. But you aren't even warm—and that's a clue."

"Warm—furnace?" I suggested.

"Too easy, Mr. Foster," Bud said. "That's an induction motor Cam's got running the furnace blower, and they don't cause radio interference—much."

"Right," Cam agreed. "How about the drive belt?"

"Static!" Bud was elated. "That's it—static discharge from the belt!"

Discouraging static. Cam nodded. "I was just about to fix it. A thin film of graphite on the belt, and a good ground on both motor and blower will discourage the static build-up."

"How about power lines?" I asked knowingly. "They get the blame for a lot of static in radio and TV sets."

"Unjustly, Jack, unjustly," said Cam. "Power systems would come at the bottom of a list of interference sources."

"And what about tree limbs rubbing against power lines?" Bud chimed in.

Cam held up his hands. "Wait, now, you two. The power companies *want* you to get good reception. A lot of people who yell the loudest make their own interference. Out-of-date wiring, for instance, and a lulu we came across recently . . ."

"Induction-heating equipment, I'll bet," Bud broke in.

An old-timer. "Not that simple," said Cam, taking a clear light bulb, obviously an old-timer, from a drawer. "Not many of these straight tungsten-filament bulbs around, but just one of them sure can mess up a lot of TV reception."

"What's the story?" I asked.

"Well, a whole two-block area was complaining of wiggly lines across the picture. We had to make a house-to-house search before we found the culprit—this bulb. A woman forgot to turn it off in an attic."

"Interesting, Cam," I observed, "but wouldn't you say that shop tools are a more common cause of interference?"

Cam laughed. "Okay, I can take a hint." He put the bulb away and went over to his chalkboard.

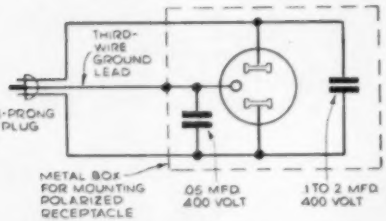
"Filters properly used will solve your TVI—television interference—problem, Jack," he began, sketching circuits as he talked. "No one filter is a sure cure. Commutator motors are the worst offenders, especially if the brushes are worn or the commutator is rough. If cleaning the commutator and installing new brushes doesn't do the job, a filter will—in most cases a simple condenser filter."

"What other kinds are there?" I asked.

Unknown source. "The combination choke-and-condenser filter used on equipment causing severe TVI." He pointed to a circuit. "A filter like this in the TV power cord will sometimes cure TVI from an unknown source if the power line is the carrier. But it takes a special antenna filter for disturbances picked up by the antenna."

Bud had been studying the circuits.

An emergency filter for borrowed or rented tools



ALL-PURPOSE FILTER, assembled in a metal receptacle box attached to an extension cord, is good for use where installing a filter at the power tool is not practical. This make-do setup is not quite as effective as a built-in filter because the tool cord may still radiate some interference. Winding the cord and tying it into a short hank will help some.

"Don't those condenser filters need a grounding circuit?"

"That's right," Cam agreed. "It lets the filter condenser bleed off electrical interference generated in the motor. A direct ground improves the efficiency of most types of filters."

"But what if a tool or appliance can't be grounded?" I asked as Cam erased the circuits and drew some others. "Can you picture a woman bothering to ground her vacuum cleaner?"

"You've got a point there, but if the appliance still causes interference, simply reversing the line cord in the outlet will often do the trick."

Bud picked up his radio. "That's for me," he said. "Mom's sewing machine gives my radio the jitters."

The filter I put together that afternoon seemed to work, but before attaching it permanently to my sander, I brought it over to Cam for a check. Just as he finished running leakage tests, Bud came clattering down the stairs.

"It blew up," he announced excitedly.

"What blew up?" Cam asked.

"The filter I put on Mom's sewing machine. It was a 20-mike electrolytic condenser in parallel with the brushes . . ."

"Oh, no, Bud," Cam broke in. "Not a 20-microfarad electrolytic?"

"Sure, Cam. The bigger the condenser the better the filter."

"Do you remember what condensers do in a radio?"

The boy pondered, and suddenly clapped a hand to his forehead. "Boy, am I a dope. Why, that 20-mike job was practically a short circuit across the line."

When I looked puzzled, Cam explained. "Electrolytics are designed to be used only with DC. The reverse polarity from AC current broke down the insulating film in the condenser. And even if the insulation isn't ruptured, those big condensers can pass a lot of AC power."

"Then how can they filter anything?"

Condensers are choosy. Bud took the floor. "You see, Mr. Foster, condensers are choosy about the frequencies they'll pass. Small condensers act like an open door to pass off high frequencies that cause interference, but like a tiny crack when it comes to letting the 60-cycle power frequency through."

"Bud's right," Cam said. "Motor brushes create a high-frequency electrical surge in the power line every time they contact a commutator segment. Small condensers bypass these interference-makers to the ground before they have a chance to travel along the power line."

"Yeah," said Bud sheepishly. "I should have remembered that the frequencies a condenser will pass vary with its size."

"This is all dandy for you and Bud," I said, "but what about my problem?"

"Yours is solved, Jack," Cam said, handing me my filter assembly, "except for one thing."

"Oh?"

"If I know Madge, she'll want a filter on each of her appliances so that she won't miss any TV programs while doing the housework." END

Rolls Royce is known the world over as an automotive masterpiece. Like 35 other great makes of cars, Rolls Royce uses Champions.

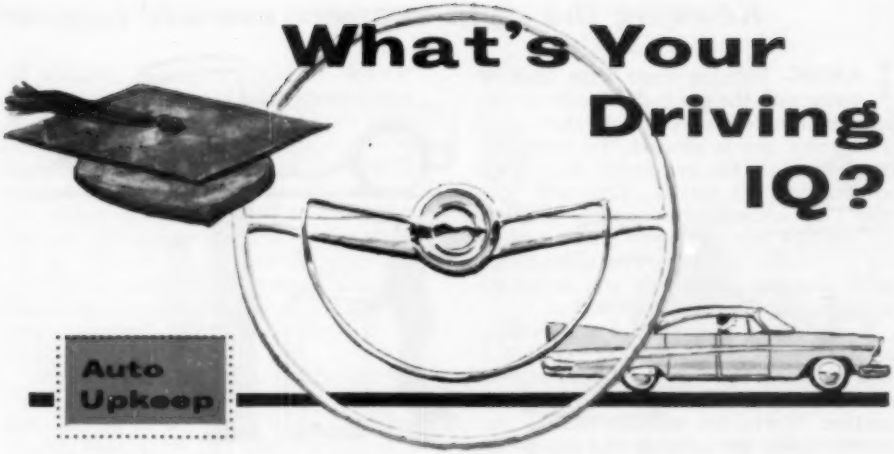
Q. Why do over twice as many car makers—including Rolls Royce—specify Champion spark plugs?

A. Champions give full-firing power. Put new Champions in your car every 10,000 miles. You'll get an *immediate* boost in horsepower...and save gasoline, too!

World's favorite spark plug on land, on sea, and in the air

CHAMPION

What's Your Driving IQ?



Study these 10 statements, then test your car sense by marking them "true" or "false"

1 When an engine equipped with automatic choke does not start right away, keep pumping the gas pedal to prevent flooding. ☐ TRUE ☐ FALSE

2 If you are abreast of a car you intend to pass and suddenly find the road is not clear, let up on the gas and apply the brakes, instead of trying to shoot ahead. ☐ TRUE ☐ FALSE

3 Lubricating oil should be changed more frequently in dusty conditions. ☐ TRUE ☐ FALSE

4 When an engine "pings" under acceleration, it is giving full power. ☐ TRUE ☐ FALSE

5 After a long, hard drive, it is good practice to let the engine idle for several minutes before you turn off the ignition. ☐ TRUE ☐ FALSE

6 Crankcase oil should be drained while it is warm, and after a car has been run. ☐ TRUE ☐ FALSE

7 When tires check about four pounds over the recommended pressure after being driven at highway speeds on warm days, do not reduce the pressure. ☐ TRUE ☐ FALSE

8 If most of your driving is in stop-and-go traffic, and you take it easy on the highways, your car can use spark plugs that are a little hotter than normal. ☐ TRUE ☐ FALSE

9 During warm weather it is a good idea to fill the gas tank at the end of a day. ☐ TRUE ☐ FALSE

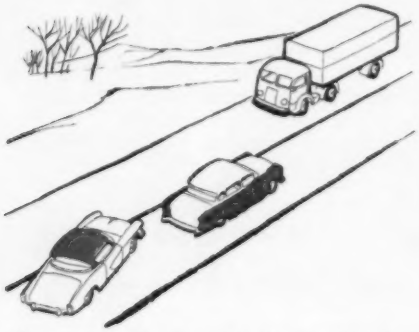
10 Driving today's high-compression, high-horsepower cars above 60 m.p.h. is poor economy. ☐ TRUE ☐ FALSE

Now score your driving IQ. For the answers and the "reasons why," turn to the next three pages

Knowing the right answers can add to your

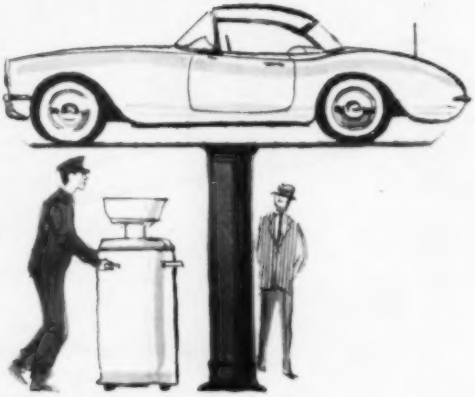
1 FALSE. Priming more than once or twice with the gas pedal floods the engine, making it impossible to start until the excess gas is cleared. To overcome flooding, push the gas pedal clear down while using the starter. This will "unload" the choke valve enough to allow air through the carburetor without picking up excess gasoline. The unloader is built into the carburetor and functions when the throttle is opened wide.

If the car is still flooded and refuses to start, hold down the gas pedal but stop cranking the engine. If your starter works with the foot pedal, turn off the ignition. Wait a few minutes and use the starter again. By keeping the gas pedal down, you do not pump gas into the engine while depressing the accelerator to use the starter. Never crank the engine for more than 25 or 30 seconds, as this may heat and damage the starter. Never let the starter run the battery clear down.



2 TRUE. Using the brakes and reducing your speed makes it possible to get back in line much quicker than you could squeeze ahead with full throttle. Braking power is far greater than accelerating power at passing speeds. By reducing your forward speed, you lessen the impact in case of collision. Also, if you try to crowd ahead you may cut off the car you are passing and cause a three-car pile-up.

There is one exception. If you see that the driver of the car you are passing is aware of your danger and uses his brakes to slow down, then use full power to slip in front.



3 TRUE. Dust is an engine's worst enemy. If you regularly drive over unpaved roads, dust gets into the engine through the air cleaner and crankcase breather, and eventually mixes with the oil. Only by frequent oil changes—as often as every 500 miles—can you be sure of minimizing engine wear caused by dust's abrasive action. Filters, too, should be changed more often than recommended under such driving conditions.

The second menace to an engine's long life expectancy is contamination of the oil from condensation, producing low-temperature sludge. If you use the car only for short trips of a few miles to and from work, or for stop-and-go city driving, oil should be changed once a month, even if the mileage is as low as 100 between changes. The more times an engine is started and has to warm up—especially in cold weather—the more the oil is diluted by condensed vapors. An occasional run on the highway will evaporate these vapors before they form harmful acids, so when short trips are combined with highway travel now and then, oil changes can safely be stretched to 1,000-mile intervals.

If your average trip is 20 miles or more at speeds that keep the engine operating at normal running temperature, the mileage between changes can be upped to the factory-recommended intervals of three to five thousand miles, depending on the make of car. Under these conditions, use a top-grade oil, and change the filter at least every other oil change.

driving pleasure, save money and accidents

4 FALSE. An engine "ping" or "knock" means not only that it is wasting power, but that the moving parts are being overloaded. The sound is caused by too rapid combustion of the gasoline, which detonates, or explodes, instead of burning. A sudden jolt is imparted to the piston without any follow-through for the power stroke. This results in terrific pressures, increasing combustion-chamber temperatures that can harm valves, pistons and rings, as well as spark plugs and rod bearings.

There are several ways to prevent "ping." Shift to a lower gear; use passing gear on hard pulls; change to higher-octane fuel; reset the ignition timing. If your engine is heavily carboned, it may be necessary to remove the head and clean out the combustion chamber.

5 TRUE. A short idling period gives the engine a chance to get rid of the extra heat developed during a hard drive. An idling engine creates less heat than one at higher speeds, under a load; and it cools down naturally. Uneven cooling of metal when a hot engine is shut off may cause damage to valves and other internal parts.

If the temperature gauge registers overly hot, stop the car facing into the wind, raise the hood, and let the engine idle until the gauge drops. Check the coolant level to see that it's not low.

6 TRUE. Driving a car for at least half an hour, and longer in cold weather, warms and stirs up the oil. This mixes the loose particles of dirt and carbon, and keeps moisture and acids suspended, so that they will all drain out with the old oil. The main reason for changing oil is to get rid of these harmful substances, and the more that can be drained out, the better service you will get from the new oil. It will have less initial contamination.

7 TRUE. Tires build up pressure at high speeds and during hot-weather driving. This is a normal condition and so long as the tire pressure was correct at the start of a trip, the increase in pressure should not be reduced.

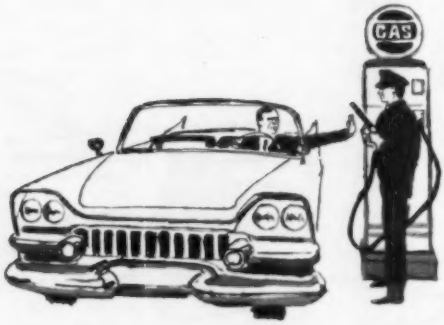
Inflate tires to the recommended pressure when they are cool. Ordinary driving friction will raise the pressure about two pounds. After a fast drive, correctly inflated tires will check four to five pounds over cool pressure. So if your tires need air after you've been driving around town, put in about two pounds more than recommended. On a highway trip, if tires seem low or squeal excessively on turns or when braking, add an extra four pounds. Otherwise the pressure will be too low when the tires cool.

8 TRUE. To perform efficiently, spark-plug firing tips must operate within a specified temperature limit. Slow town driving, with idling in traffic, may drop the firing-tip temperature low enough to be within fouling and carbon-forming range. If you don't do much fast driving, which would burn away these accumulations, frequent cleaning will help prevent misfiring, and the next-hotter plug will give you longer and more efficient service. A hot plug with its longer firing tip cannot dissipate heat as readily as a short-tipped plug, and carbon deposits burn off at lower cylinder temperatures.

The fouling condition results in dark, dry carbon formation on the electrodes, insulator tips and metal parts, unlike oil-fouled plugs, which have a wet, oily carbon on the exposed parts.

If you drive mostly in city traffic, and don't speed on the highways, your car probably will do better with plugs one step hotter than recommended for normal driving.

Good driving habits add to your car's life



9 FALSE. Filling the tank at the end of a day may save you a few minutes on the next morning's start, but it will come out of your pocketbook. Gasoline expands during the heat of the day. When it cools in your tank at night, it will shrink, and in the morning you'll have less than you paid for, even though the full number of gallons were pumped in through the meter.

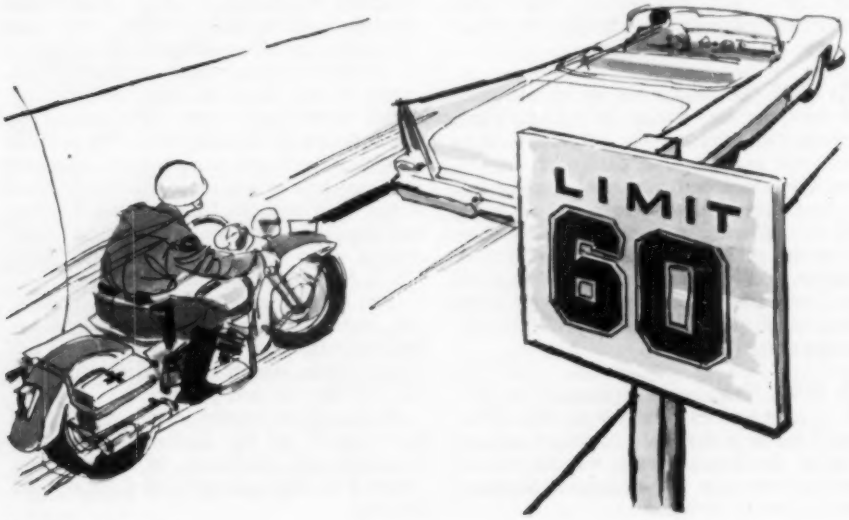
10 TRUE. Although today's cars will maintain high road speeds, it is still poor economy to go faster than 60 m.p.h. Gas mileage is sacrificed for speed and power when you push the needle much over 45. Your car may give 18 miles to the gallon at a steady 30 m.p.h., but drop to around 12 miles to the gallon at 60. Above that speed you put more wear and tear on the brakes, and every time you use the brakes some of the gas mileage you paid for is eaten up. Then, as you open the throttle, gas pours through the carburetor and more mileage goes out the tailpipe.

Faster tire wear is another penalty of high speed, both from increased friction and the greater amount of acceleration and braking.

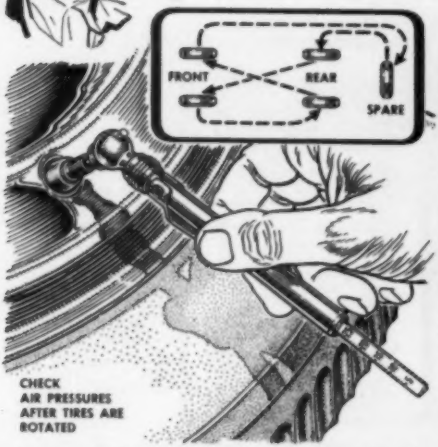
Safety, translated into terms of doctor and repair bills, is another factor. With a powerful and easy-riding car, the speedometer can climb to 70 or 80 before you know it. Too late you may find yourself without room to stop, or approaching a curve at a speed too great to hold the car on the road.

Then, too, high-speed driving uses up more oil, and deceleration pumps extra oil by the piston rings; moving engine parts get more wear; the chassis takes a greater beating.

It is poor economy to pay this extra cost of fuel, tires and repairs, while taking unnecessary chances. You can still make good time on the highways without topping 60 m.p.h.—*Robert V. Thompson.*



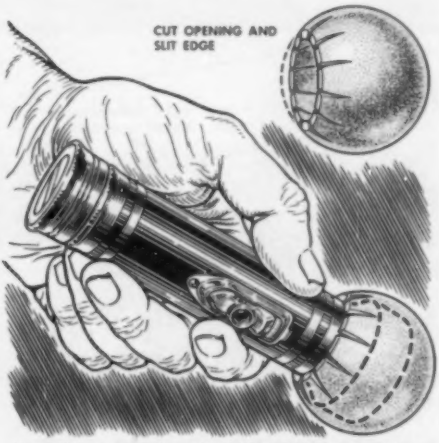
Hints from the Model Garage



After switching tires, remember to check pressure in the new position. Front tires should carry a few more pounds than rear, and rotating puts the softer rear tires up front (see rotation chart above) where they may prove to be underinflated.

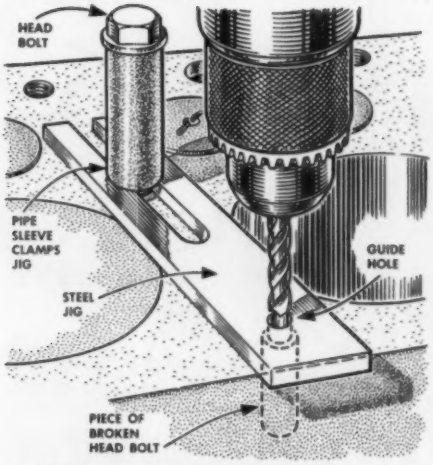
Checking door-lock buttons to see that they're down can be done with a glance if you put a band of red paint or colored tape on them. When the buttons are pressed down, the bands disappear. If you can see a band, the door is unlocked.

A good makeshift creeper for work beneath your car can be had from a large carton opened flat. It can be shifted about easier than papers or a cloth and the thick board gives your back protection from damp or greasy ground or concrete.

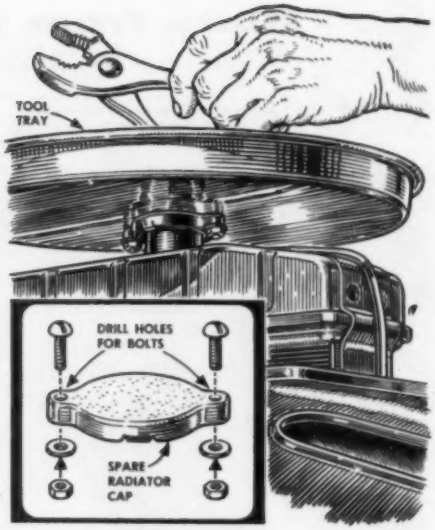


Cap the lens of a flashlight with a rubber ball to protect it while being carried in the trunk, glove compartment or tool box. Cut an opening in the ball, then slit the edge of the opening so it can easily be forced over the lens of the flashlight.

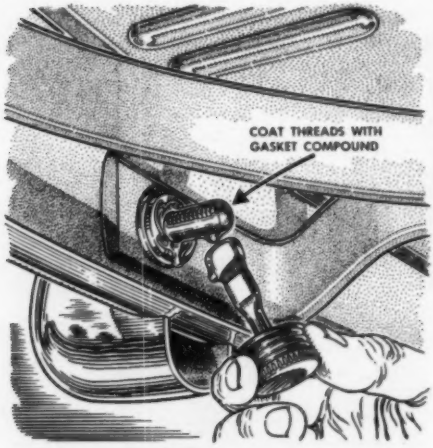
More Hints from the Model Garage



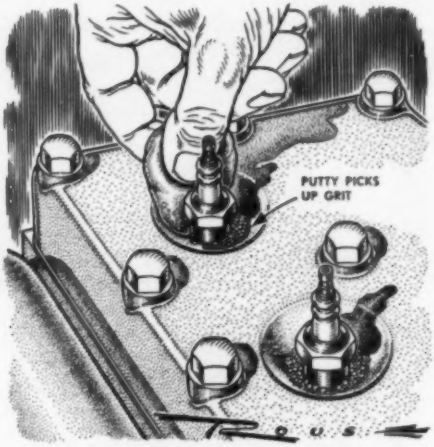
To drill out a broken bolt without damaging the threaded hole, clamp a simple jig under an adjacent bolt to center the drill. To make the jig, cut a slot in one end of a steel strip and drill a guide hole near the other end for the drill bit.



A tip-proof tool tray can be made by bolting a large pie tin or serving tray to the top of a spare radiator cap. Mounted on the radiator's filler neck in place of the regular cap, the tray is handy as you work in the engine compartment.



A coating of gasket compound over the protruding end of a bolt exposed to the weather will keep it rust-free and easy to remove. Protect license-plate bolts this way, and coat bumper-bracket bolts, fender and body bolts when new.



Pick up dirt and grit from spark-plug wells, so plugs can be removed without contaminating the cylinders, with a ball of putty or wallpaper cleaner. Press it in firmly, close to the plug. When you lift it out, the grit will adhere to it.

Guide

T-3

SAFETY-AIM HEADLAMPS

Buy in pairs where you see

AC

Watch Walt Disney Studios' ZORRO every week on ABC-TV

Your family deserves all the safety you can provide . . . deserves the extra safety of new Guide T-3 Headlamps.

With Guide you see farther down the road because this new, industry-approved sealed-beam headlamp, introduced just two years ago, has stepped-up power plus a new light pattern which throws more light on the right—where you need it most.

But, most important of all, these new Guide T-3 Headlamps can be perfectly aimed in minutes—in broad daylight!

Three "Guide Points" on the face of each T-3 lens are ground to tolerances within one ten thousandth of an inch. This precision, and the simplicity of the T-3 aiming method, assure you of MORE LIGHT—AIMED RIGHT . . . more safety for both you and your family.

If the headlamps in your car are two years old or more, have them replaced with new Guide T-3s now. And have your headlights aimed at least twice a year.

AC THE ELECTRONICS DIVISION OF GENERAL MOTORS

Just overhauled by the town's new mechanic, Stafford's car was stone-cold dead at the market

Gus Gives a Competitor the Business

By Martin Bunn

WALT SOMMERS, the local plumber, was jubilant when he telephoned Gus Wilson at the Model Garage, to inform him that Oliver Stafford required his services. Stafford was out at the new shopping center, which had sprung up in the suburbs like a mushroom in lush soil.

"I warned Stafford not to have his car overhauled by a Johnny-come-lately like Paul Ryberg," Walt crowed. "I tried to get him to take his work to you, but he wouldn't listen. Now his newly overhauled motor is out here on the shopping-center parking lot, stuck tighter'n a glacier in Alaska. Get out here fast, Gus, and take over."

"It seems to me," Gus said, "that the man to call is the fellow who did the overhaul. Why don't you give him a ring?"

"Are you nuts, Gus?" Sommers inquired. "You've been in the garage business around here for years and now these newcomers like Ryberg are out to cut your throat. This is your chance to show Ryberg up."

"What have you got against this man?" Gus asked the plumber.

"Nothing," Sommers said. "Absolutely nothing. I hardly know him. But with all this new building in the suburbs, it's up to us old-timers to hang together. I'm a plumber and you're a mechanic. If we don't work together to beat down new competition, we're sunk."

"If Paul Ryberg did Stafford's overhaul," Gus insisted, "he's the man to call in on this."

"That's just it," Sommers said exultantly. "Ryberg's away on vacation. Any-

Gus began to remove the spark plugs. Nothing happened until he took out the third one.

way, Stafford's so mad about this now that he wouldn't call him if he could. In fact, he asked me to call you."

"In that case," Gus agreed, "I'll be right out."

WHEN Gus arrived at the shopping center he found that Stafford's stalled car was attracting considerable attention. People going in and out of the various stores were stopping to ask questions and offer advice. It occurred to Gus that if Paul Ryberg's overhaul job had indeed gone sour, he was in for a lot of bad publicity. On the other hand, the Model Garage, coming to the rescue in Ryberg's absence, stood to gain favorable attention.

Walt Sommers smiled as Gus approached with his tool kit. "Here comes the fellow I wanted you to give your work to, Stafford. Gus, this is Oliver Stafford, one of our newcomers."

"Glad to meet you, Stafford," Gus said as he put down his kit. "Walt phoned me that you were having trouble."

"That's right." Stafford's eyes held a glint of exasperation. "I had Ryberg do a complete overhaul—valves, rings, bearings, everything. And now, in less than

a hundred miles, my motor gets hot and sticks. The starter won't budge it."

"You say that the motor got hot?" Gus asked.

"Yes. I noticed that the heat gauge was in the red when I parked, but I sort of expected this with a tight motor. But I didn't expect the engine to be stuck tight when I came out from shopping."

"Maybe it isn't," Gus said. "Perhaps the starter gear is locked in the flywheel ring gear. I'll take a look."

Gus pulled the starter and found it free. With the ring-gear teeth exposed, he tried to turn the motor by prying against the teeth with a bar. But the motor was, indeed, so tight that it was impossible to budge it. As he straightened from replacing the starter, he found himself ringed by curious shoppers.

He smiled to himself when he heard one of them say, "So that's Gus Wilson, eh? I've heard he's a whiz."

Gus turned to Stafford. "You say the heat gauge was in the red when you parked? Modern engines don't usually heat up that much on an overhaul."

Walt Sommers spoke up loudly: "It depends who has worked on them. If you don't know your business, anything can happen."

GUS raised the hood, removed the radiator cap, peered inside.

"Hmm," he grunted. "Water's awfully low."

He got down on his knees, peering under the car, looking for leaks. Seeing none, he began to remove the spark plugs. Nothing happened—until he removed the third plug on the six-cylinder head. As he took out this plug, water spouted high as though under pressure.

"She'll turn over now," Gus said, wiping moisture from his leathery features. "You must have a leaky head gasket."

"Leaky head gasket!" Stafford exclaimed. "But how would that make the motor stick so it wouldn't turn over?"

"When you parked your car," Gus explained, "number three cylinder was about to come up on the compression stroke. It filled with water, probably from a leaky head gasket, while you were in shopping. When you tried to start the car, the piston moved up against the water. With a well-fitted set of rings and a perfect valve grind, so that the water couldn't escape, it would act about the same as a cylinder full of cement. Ryberg must have done a good job on those rings and valves."

Stafford grunted. "And how about the water in my cylinder?"

"It sounds like a faulty head gasket," Gus repeated.

"Yeah," Walt Sommers commented. "Maybe Ryberg just forgot to tighten the head bolts."

As Gus turned, planning to fetch his tow car and take the car into the shop, his eyes met the interested and curious gaze of the ring of spectators, mostly new faces to the area. He hesitated, then stooped to pick up his long-handled torque wrench.

"It's possible," he said thoughtfully. "Let's see."

He began to run the torque wrench over the head bolts, testing them for tightness. The center bolt of the middle row turned easily under his hand and lifted. Gus took it out. It was broken off.

"Hah," Walt Sommers said. "Some of these young, inexperienced bucks don't know their strength. Ryberg twisted that head bolt right off."

"Maybe, but not probable," Gus said, taking his flashlight and peering down in the hole the broken bolt had come from. "The stub end of this bolt shows a rust streak through the metal that indicates a flaw. I'd better tow you in to the shop, Stafford."

IN THE Model Garage, Gus faced the tricky job of removing the broken stub of the bolt from the cylinder block.

"How on earth will you get that out?" Stafford wanted to know.

"The usual way," Gus told him, "is to drill a hole through it and then screw in a reverse-threaded tool made of steel hard enough to cut into the broken stub and remove it. The only trouble with that method is that if you drill too large a hole in the broken end of the bolt, the tool will bulge the skeleton of the bolt and lock it in the cylinder-head threads. If you drill too small a hole you have to use too small a reverse-threaded tool to stand the strain of taking out a rusted-in head bolt. If you break the tool off you're really in a jam, since it is made of steel too hard to be drilled."

"Then how do you get it out?" Stafford

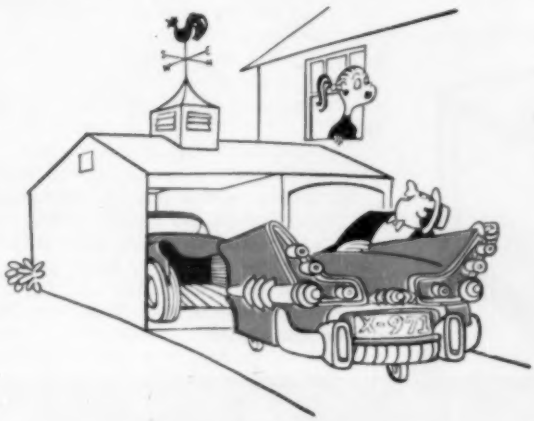
asked. "It seems like an impossible job."

Gus grinned.

"If a man's hand is steady enough," he said, "he drills a perfectly aligned hole down through the broken bolt end, just a hair smaller than the bolt. The remaining portion of the bolt is then so thin-walled that you can break it away from the cylinder-head threads with a fine chisel. Then you can take it out with the end of a rat-tailed file."

"You sure know your business, Wilson," Stafford said as he watched Gus delicately remove the broken stud bolt from the cylinder head. "Walt Sommers warned me that Johnny-come-latelies are dangerous, in plumbing or in auto repair. I should have given you my work."

"I'd have been happy to have it," Gus said. "But it seems to me that Ryberg did a good job. My torque wrench showed that the rest of the head studs were tightened to 60 foot-pounds, as the factory specifications for this car recommend. Ryberg would hardly bear down on this one bolt and break it off. Since we know from the rust streak through the metal at the break that there was a flaw in that stud, which Ryberg couldn't have known about or prevented, I hardly see where he can be blamed."



"This 'bustle' rear is removable so we can close our garage door."

Stafford spoke thoughtfully: "It seems to me that you are either a very square guy, Wilson, or you don't want any more business."

"I want all the business I can get," Gus told him, "but not by digging at a competitor's reputation. I wouldn't know Paul Ryberg if I met him face to face, but I do know the bad publicity a thing like this could bring him in a new community. It could put him out of business."

Stafford countered, "And give you more business."

"Probably," Gus said. "For a while. But this area is growing so fast that we need all the skilled help we can get. Folks expect services when they move to a new place, and if they don't get them that place stops growing. In the long run, putting the skids under a fellow like Ryberg would cause me and everyone else in the community to lose. The way I see it, his coming here is progress."

"I guess it is, at that," Stafford conceded. "If folks who move here don't get the services, they'll stop coming. Maybe Sommers didn't think of that. By the way, I hear Paul Ryberg's brother is coming, too, to open a shop in town."

"You don't say," Gus said. "Do you know what line he's in?"

"Yes, let's see—Ryberg told me." Stafford's eyes suddenly widened as they met Gus's. "Come to think of it—his brother is a plumber."

"I see," Gus said, and he did see very clearly.

He drained Stafford's car of oil, to make sure there was no water in the oil pan, and set about installing a new head-bolt stud and gasket.

As he worked, his mind drifted to Walt Sommers. Some folks, he thought, are scared of progress when it starts getting close. END

Next Month: Gus does it by the numbers.

Transistors power **Servo-System Hi-Fi**

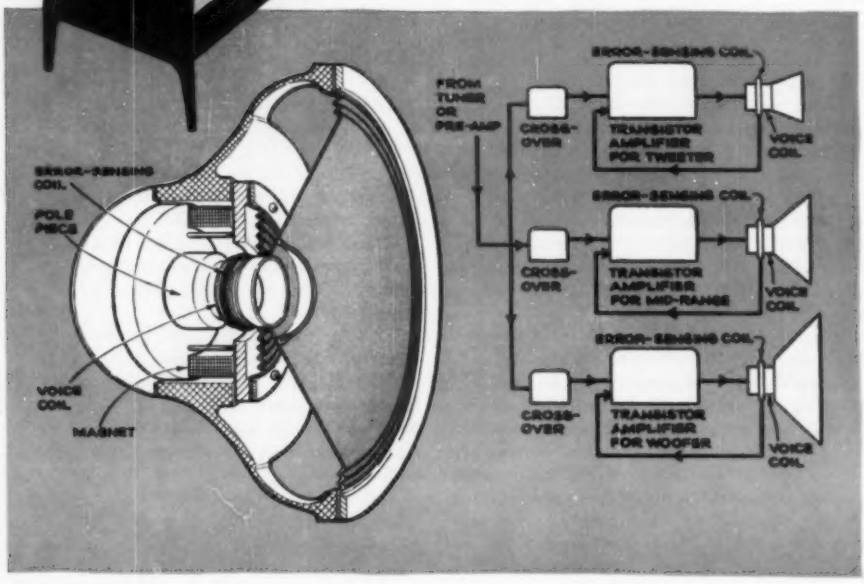
A FACTORY-SEALED timer backs up a guarantee of 2,000 hours of satisfactory performance for a new hi-fi speaker-amplifier unit. That's about five years of normal operation. The timer operates only when the unit operates and will show at any time whether the guarantee has been met.

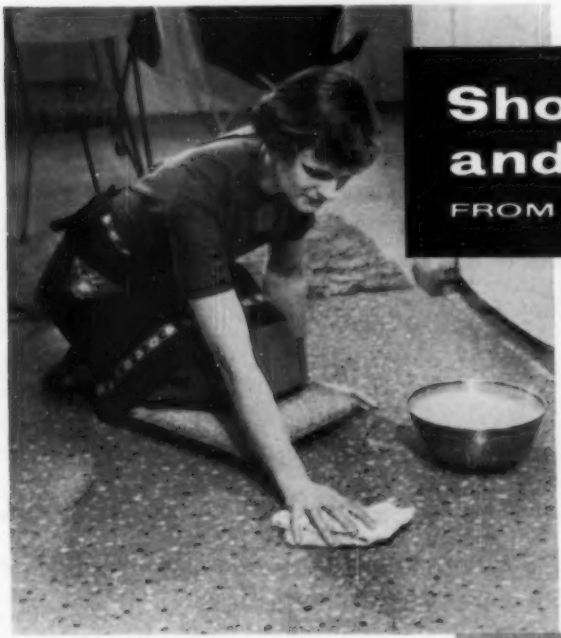
Performance specs are impressive, too. The maker guarantees response within three decibels from 35 to 16,000 cycles at less than one-percent distortion for one acoustical watt output (about 20 electrical watts).

This new integrated sound-reproduction unit incorporates an unusual concept. It combines the functions of amplifier, loudspeaker and enclosure in one electro-acoustic network.

Transistors and a new speaker have made a commercial reality of a system long considered theoretically desirable by engineers. Theory: If you can get exact information about the sound being produced by a loudspeaker, this signal can be fed back to the input of the driving amplifier and compared to the original signal. Any differences in the two signals would be due to error on the part of the amplifier or loudspeaker. This error signal can then be incorporated in the incoming signal in such a way that any shortcomings are continuously compensated.

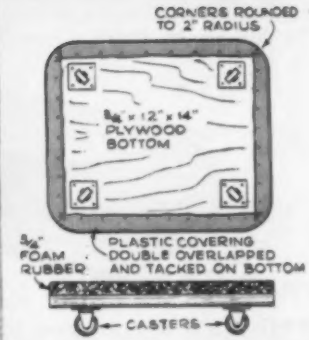
The Integrand system does just this. Three different speakers cover the audible range. Each speaker has an error-sensing coil, mounted in the center of the voice coil, that feeds back information to its own transistor amplifier. Both monaural and stereo Integrand units are marketed by Brand Products, Inc., Westbury, N.Y. Prices start at $395.





Short Cuts and Tips

FROM PS READERS



Knee Pad Can Roll Around Floor

My wife gives the kitchen floor a thorough scrubbing in relative comfort by kneeling on the cushioned dolly I made. We move heavy objects with it, too.

I glued a foam-rubber pad to a 12"-by-14" platform of 3/4" plywood. The platform's corners were rounded to a 2" radius. Over the trimmed rubber pad I stretched plastic upholstery material and doubled the edges before tacking them down. Four swiveling casters went on the bottom.—*Ronald Anderson, Minneapolis.*

Could You Use This Idea?

Too much noise from a workshop or recreation room? You can muffle the sound effectively with perforated hardboard panels backed by glass-fiber insulation blankets.

Laboratory tests made for the Masonite Corporation indicate that these two common materials provide a satisfactory measure of noise reduction compared with common acoustical material. The panels used were 1/8" Peg-Board with 3/16" holes spaced on 1/2" centers. The glass-fiber blankets can be placed between furring or wall studs and the hardboard panels nailed over them. Painting the panels doesn't affect sound-deadening ability, it is claimed.

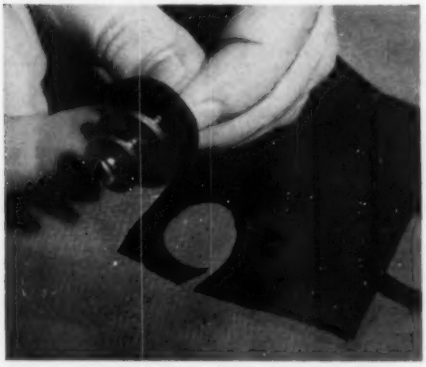
Short Cuts and Tips

Heavy Roofing Rolls on Skates

HANDLING heavy papers and roofing felt is a lot easier when the roll is cradled by a pair of roller skates. I nail the skates upside down to a board, adjusting the distance between them to balance the roll.—*John Fields, Chesterfield, Ind.*

▶▶▶HERE'S a way to speed up frequent shifts of garden hose from one faucet or sprinkler to another. Put several extra washers in each coupling as spacers. Doing that leaves less thread to be engaged. —*John Cavanaugh, Monterey, Calif.*

▶▶▶I FOUND that the carburetor cleaner used in garages will dissolve India ink quickly and completely. To keep drawing pens clean without scraping them, I dip the points in cleaner and wipe them dry with a cloth.—*John Nestler, Tampa, Fla.*



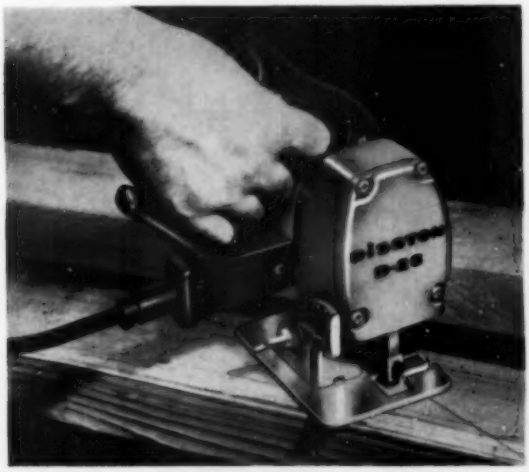
Simple Plug Repairs Leaky Tank

SMALL leaks in metal containers, such as water tanks, are easy to repair. Slip a couple of washers over a sheet-metal screw and add a large rubber disk cut from a scrap of inner tubing. Screw the plug in tight. The pressure of metal washers on the rubber will insure a permanent seal.—*Frank Javor, Newark, N.J.*

Punch Turns Out Index Tabs

THESE index tabs are economical to make and they stick to anything. I type numbers on gummed paper, such as a label, and cut them out with a large paper punch. For contrast or special keying, I use colored paper. The tabs are handy whenever I want to sort or file something in a hurry.—*Fred Jenkins, Deal, N. J.*

Zips through 2 x 4's . . . cuts ¼" steel plate . . . cuts ½" aluminum plate



Plunge cuts without a drilled hole!

Cuts through hardwood 2 x 4's at 45° angle!

Cuts intricate figures in all materials!

Detachable electric cords come in lengths up to 100 ft.!

NOW! THE WORLD'S MOST USABLE POWER SAW!

The revolutionary DISSTON D-23 Electric Handsaw!

This brand-new multi-purpose power saw answers the crying need of home workshop owners everywhere. It gives you—in a single professional tool—a whole shopful of power saws. Weighing only 4½ pounds, *it does more cutting jobs than any other saw of its kind.* Rips, crosscuts, mitres, bevels, scrolls. Does heavy workhorse cutting or fancy figures with equal ease and precision.

The Disston D-23 Electric Handsaw cuts every common home workshop material. It cuts wood, plywood, plastics, rubber tile, linoleum tile, asphalt tile, laminated paper and cloth, nylon and Plexiglass. It cuts ¼" steel plate, ½" aluminum plate, angle iron, copper, bronze and brass. It cuts pipe, tubing and sheets.

Features unmatched by other saws have been engineered into the Disston D-23 Electric Handsaw to make it the world's *finest*—as well as the world's most *usable* power saw. First, it gives you more *cutting power* than any other saw because it has the highest output horsepower. A 3-amp motor drives it at 3800 strokes per minute. Second, it cuts *faster* than any other saw because of remarkable ORBITE action. The blade slices through material on the upstroke, but backs away on the downstroke. This also reduces fraying, need for sanding, and blade wear. Third, the new Disston D-23 Electric Handsaw *cuts more accurately* and *lasts longer*. It is the *only* reciprocating saw with all needle and ball bearings—9 needle and 3 ball bearings. Check these features against *any* saw now on the market.

Your most economical buy in power saws. Think of the 1,000-odd uses you have—right now—for this power-packed lightweight! In home repairs and improvements you'll be able to make. In do-it-yourself projects. Think of the times you've wished for just one additional saw for a particular job at hand. Think of the times you've said to yourself that one day you'll have *all* the saws you need. *You can have them all* right now in this built-to-last, most usable power saw ever made. With four blades, rip fence and 10-foot detachable cord, the revolutionary Disston D-23 Electric Handsaw sells for just $98.50.

FREE! "Must" reading for every man interested in fine tools—Disston Workshop Manual No. 1. Read it before you buy *any* saw!

H. K. PORTER COMPANY, INC.

DISSTON DIVISION

414 Tacony, Philadelphia 35, Pa.

FREE!
MAIL THIS COUPON TODAY!

Gentlemen: Please send me a free copy of your Disston Workshop Manual No. 1, describing the remarkable Disston D-23 Electric Handsaw. I realize there is no obligation on my part.

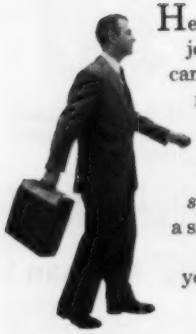
Name_____

Address_____

City_____ Zone_____ State_____

New Kodak 300 Projector

yet shows your slides bigger,



Here's a color-slide projector so lightweight you can carry it like a portable radio . . . so compact, you can store it on a bookshelf. Best of all, it lets you enjoy thrilling *big-screen* projection even in a small room. At a distance of 10 feet, for example, your favorite 35mm color slide will fill a 40-inch-wide screen.

You really have to see and handle the new Kodak 300 Projector to appreciate its remarkable versatility. Try the focusing and elevating mechanism . . . the smooth glide of the new Kodak Readymatic Slide Changer. And when you project your favorite color slide, notice that the rock-steady picture you get is brilliantly illuminated *clear to the corners!*

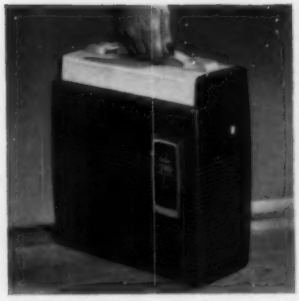
Your Kodak dealer will be glad to show you the new lamp-condenser system and superb 4-inch, *f*/3.5 lens that produce these superior screen results. Ask him, too, about the Kodak 300 Projector's ultra-quiet cooling system . . . built-in cord storage space. Complete with self-cover.

Kodak 300 Projector with Readymatic Slide Changer (holds up to 36 slides in cardboard mounts), $64.50 . . . or as little as $6.45 down.

Kodak 300 Projector with 36-slide self-storing Magazine Changer, $74.50 . . . as little as $7.45 down.

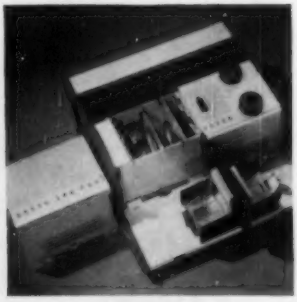
Prices are list, include Federal Tax, and are subject to change without notice.

The only projector with the completely new



SO LIGHT, SO COMPACT, so easy to carry! Has self-cover, measures only 5 x 11 inches square, weighs only 9 pounds.

FOCUSING AND ELEVATION adjustments are fast . . . precise . . . with all essential control knobs at your finger tips.



QUICK, E-A-S-Y ACCESS to the lamp and condenser compartment—storage space for your lamp cord is built right in.

EASTMAN KODAK COMPANY,

is ultra-portable

brighter!

Kodak **READYMATIC SLIDE CHANGER**

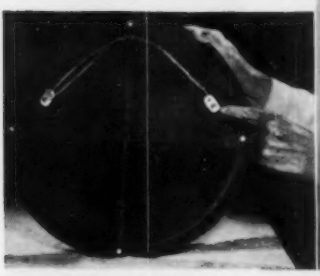
PROJECTS 35MM, BANTAM, or the new, big 1½ x 1½ slides. Also (with an adaptor) single frames of your stereo slides.

CHOICE OF EXCLUSIVE new Kodak Readymatic Slide Changer which accepts up to 36 slides per loading, or self-storing, magazine-type slide changer.

Kodak
TRADE-MARK

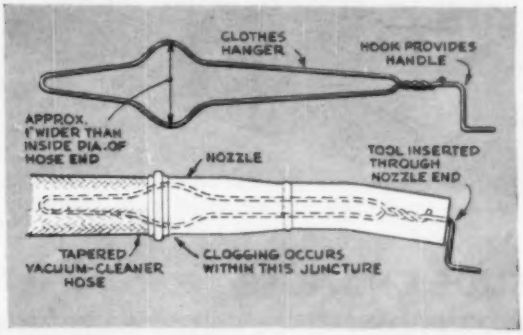
Rochester 4, N.Y.

Short Cuts and Tips



Easy-to-Mount Mirror Backing Makes Handsome Frame

DECORATIVE, prefinished hardboard can make any mirror as pretty as a picture. For this round one, the outline was traced on the back of black-and-gold marble Marlite. Then, with the finished side up, an outsize circle was cut with a fine-tooth handsaw, and bolt holes drilled for brackets and hanger clips.



Bent Wire Hanger Cleans Vacuum Hose

WHEN a tapered vacuum-cleaner hose clogs, the trouble spot is usually where hose and nozzle join. A wire coat hanger, bent as shown, will clear it. Push the tool into the nozzle until the loop-spring is forced against the walls of the juncture. A few turns of the handle will then loosen the debris that is causing the jam.—*Bruce D. Stewart, Winder, Ga.*

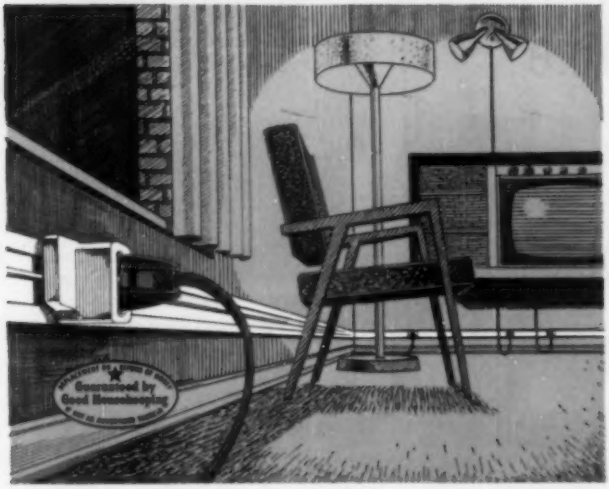
COMING SOON:

Two Bonus Booklets on House Painting

In March PS: *You'll want to read and save this bonus booklet: "Things to Do Before You Paint Your House." It's packed with tips on old-paint removal, calking and puttying, minor repairs, and estimating paint quantities. It gives you a time-saving shopping list, and sound advice for choosing the right paints, brushes and rollers.*

In April PS: *When you're ready to take brush in hand, a second booklet, "The Know-How You Need When You Paint Your House," will see you through the actual job of brushing new beauty onto your home. It tells you every trick of the trade, from the right sequence to follow when you paint window sash to cleaning brushes the easy way.*

5 EASY STEPS TO UNLIMITED ELECTRICAL OUTLETS

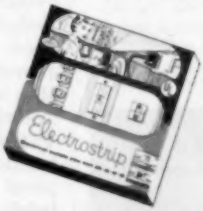


Electrostrip

PATENTED ®

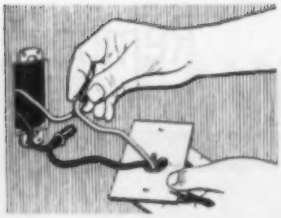
Have all the electrical outlets you need with Electrostrip. Now in a new "do-it-yourself" kit, this modern home electrical system lets you twist in outlets any place along the strip . . . plug in lamps, appliances, TV exactly where you want them. Enjoy the extra convenience Electrostrip brings to every room in your home . . . install it yourself.

Electrostrip attaches to existing outlets quickly and easily. It mounts on walls, moldings, anywhere . . . can be painted to match any color scheme. And it's listed by Underwriters' Laboratories. Get Electrostrip from your hardware or building supply store. BullDog Electric Products Co., Box 177, Detroit 32, Michigan. In Canada. Toronto 15. © BEPCO

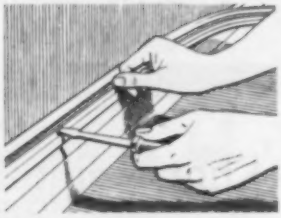


Look for the colorful kit: 15 feet of strip, 4 outlets and fittings with detailed and easy-to-follow installation instructions —all for only $9.95. You'll enjoy full HOUSEPOWER with Electrostrip.

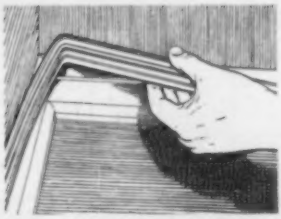
Made by BullDog Electric Products Co., a division of I-T-E Circuit Breaker Co.



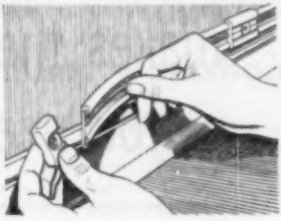
1 Make connection



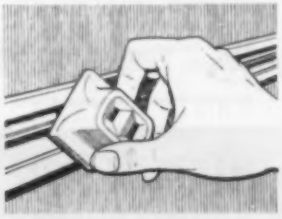
2 Mount Electrostrip



3 Bend at corners



4 Affix end caps



5 Twist in outlets

Remodeling?

Building Furniture?

Sharpening Tools?

Nicholson

makes the file you need

Available at hardware and building supply dealers.

FREE TO HOME CRAFTSMEN: *"File Filosophy."* Big new edition; dozens of illustrations show you how to use and care for your files. Send for your free copy soon.

NICHOLSON FILE COMPANY
Providence 1, R.I.

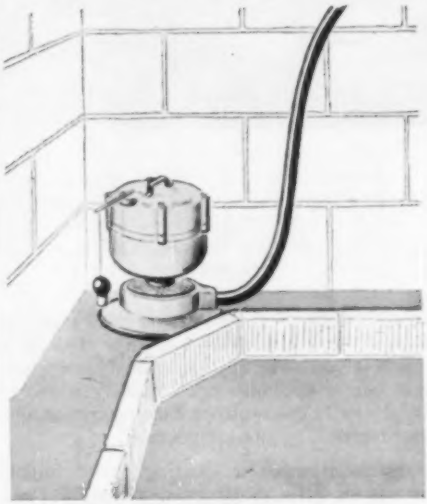
(In Canada: Nicholson File Company of Canada Ltd., Port Hope, Ontario)

NICHOLSON FILES
A FILE FOR EVERY PURPOSE

Old Battery Cable Supplies Copper Wire

SALVAGE an old battery cable and you have a good source of copper wire. Cut away the battery-terminal end, strip off the insulation and hang the cable so it will be handy in the shop. Strands can be separated from the cable, unwound and cut to length as needed for lacing or wrapping jobs.—*R. V. Thompson, Clinton, Iowa.*

▶▶▶Screw caps on bottles and cans containing liquids that evaporate readily should be airtight. If the cardboard seal in the cap is lost or damaged, cut a new one from heavy automotive gasket paper.—*Ralph Thomas, Cedar Rapids.*

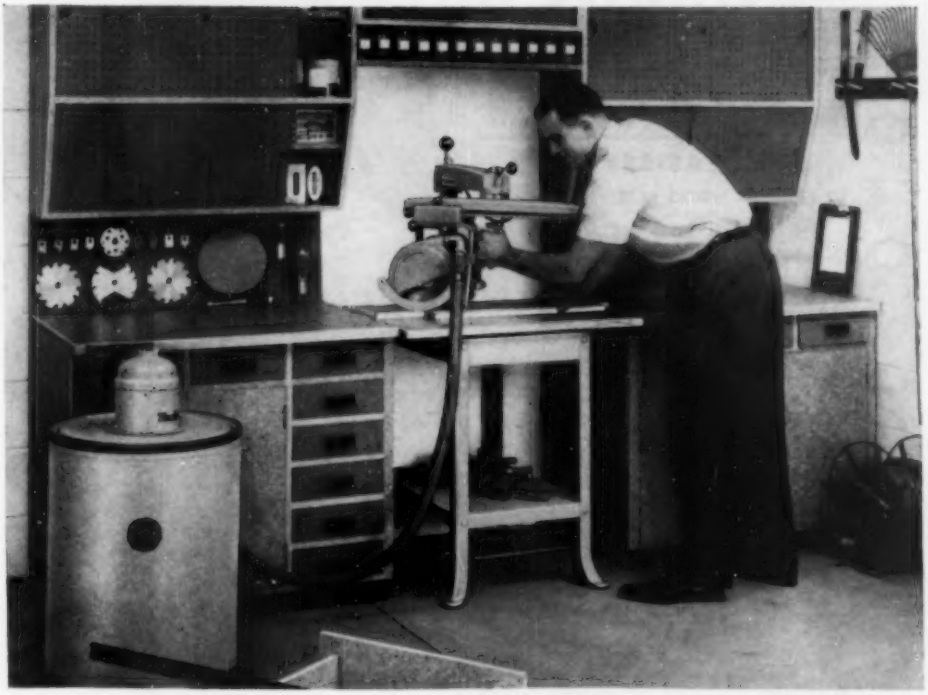


Brick Dike Channels Seepage

ALTHOUGH I have a sump pump in my cellar, a flat cement floor kept rain and snow seepage from draining off. To remedy the lack of grading, I built a dike that channels wall drippings to the pump. A single row of bricks, it is set back about 4″ from the base of the walls. I used asbestos-fiber roof cement to make a waterproof mortar and, after it set, coated the brick with decorative floor enamel.—*Andrew B. Newman, North Hills, Pa.*

ROCKWELL-BUILT

DELTA "900" RADIAL SAW



most powerful radial saw built for home workshops

Rugged as it is good looking, the New Advanced Design "900" Radial Saw is powered by a *full* ¾ hp motor. And it's so versatile that actually it's a complete, *all-purpose* workshop! You can rip, cross-cut, drill, sand, shape and do many other jobs fast and accurately. Also shown above is the New Advanced Design Delta Dust Collector. Use it with *any* power tool to keep your shop free of sawdust—even to spray paint. It's powerful enough to pick up a 1" steel ball.

IT'S SO EASY TO OWN THE BEST!

Because Delta makes the world's most *complete* line of combination, all-purpose and individual power tools, you can choose tools exactly right for *you*. And you'll have the "newest look" in the world's finest power tools.

BUILD THIS ALL-PURPOSE SHOP

Delta experts designed the compact workshop shown above so that you can build it in your garage or basement. Easy-to-follow plans and the New Delta Reference Guide are yours—for just 10¢—send your remittance with your name and address to Rockwell Manufacturing Co., Delta Power Tool Division, 504B N. Lexington Ave., Pittsburgh 8, Pa.

Do it now — then see all the New Advanced Design Delta Tools at your Delta Dealer. (He's listed under "TOOLS" in the Yellow Pages.) Or at leading Department, Hardware, and Building Supply Stores.

DELTA POWER TOOLS

another fine product by

ROCKWELL

?? SHOP QUIZ ??

Question 1

What's the **EASIEST** way to drive wood screws?

Question 2

What's the **EASIEST** way to remove wood screws?

Question 3

What's the **EASIEST** way to run nuts or bolts on or off?

Question 4

What's the **EASIEST** way to use heavy-duty cutting tools like hole saws, masonry and auger bits?

WITH YOUR ELECTRIC DRILL AND A

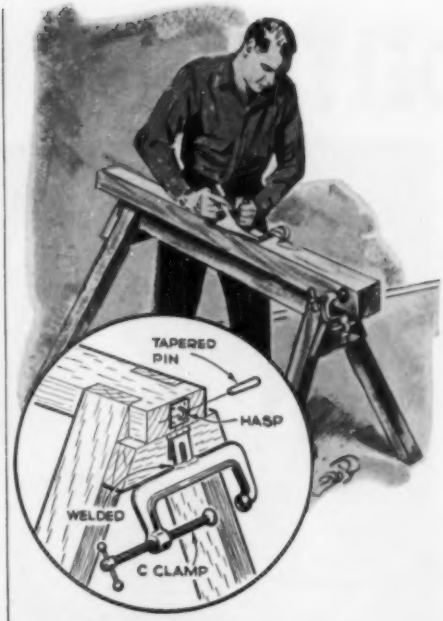
Supreme Versamatic

Reversible speed reduction attachment that fits every power drill. Increases power 7 times. Reverses with one simple twist. A *must* for every drill owner.

$14.95 AT LEADING TOOL COUNTERS

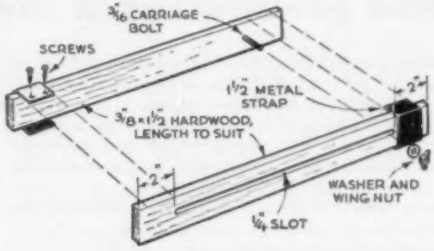
By the makers of SUPREME BRAND CHUCKS

SUPREME PRODUCTS CORPORATION
2222 S. Calumet, Chicago 16, Illinois
A Division of A•S•R Products Corporation



C Clamp Is Sawhorse Vise

A C CLAMP fastened on the end of a sawhorse makes a neat device to hold lumber for dressing. The clamp is welded to a hasp which is then screwed on the horse, as shown in inset. A tapered hardwood pin holds the clamp in locking position.—*Victor H. Lamoy, Upper Jay, N. Y.*



How to Make an Extension Rule

THIS sliding stick for inside measurements is made from two strips of scrap hardwood. Put a bolt through near the end of one and slot the other; then fasten the two together with strap metal, as shown in the drawing. Use a cardboard shim to provide some sliding clearance. —*S. F. Franklin, Port Stanley, Ontario.*

PROVED AND APPROVED

"Around the World" WITH FORD

THE **Sealed Power**

STAINLESS STEEL OIL RING

GET YOUR COPY

FORTY PAGES. PROFUSELY ILLUSTRATED. JUST OFF THE PRESS.

A new, revised and expanded edition of a practical booklet that amateur and professional mechanics and industrial arts teachers by the tens of thousands have used and endorsed. Illustrates scores of ways for doing it better and easier with thirty different hand tools. Tips on proper care and maintenance of tools along with other useful information for the mechanic and hobbyist. The coupon will bring your copy by return mail.

SEND A DIME OR GET YOUR COPY FREE WITH THE PURCHASE OF ANY CRESCENT TOOL.

Ask Your Hardware Dealer.

CRESCENT TOOLS
Give Wings to Work
Sign of the Artisan
Symbol of Excellence

To Crescent Tool Co., Jamestown, N. Y.
Enclosed find 10¢ for my copy of
"HOW TO USE HAND TOOLS."

Name .....
Address .....
.....

Inside Russia by Car
[*Continued from page 104*]

rozhe we were stopped decisively by a militiaman. As we waited, the first of a strange procession appeared—two men carrying red flags, then two others carrying medals on red-velvet panels. Next came women bearing vast floral pieces, followed by perhaps 200 men, women and children and a small brass section playing stirring yet melancholy music. The slow procession trudged solemnly up a slope. Finally came a wooden casket, carried by several bearers.

Russian drivers are different. They are less competitive than we are, except in Moscow's heavy traffic. They are also notably helpful; if you run out of gas, you put an empty jerry can on the car roof—it will stop the first truck that goes by. And they seem rather fatalistic about breakdowns. Russian trucks get run to death before they rate an overhaul, so that many an off-the-cuff repair has to be made on the road. Russian mechanics impressed me. We had a difficult welding job done in Moscow; it turned out excellently. We also had a tubeless tire repaired there. The mechanic (who had never seen one before) not only fixed it, but achieved an airtight seal when he remounted it—he checked it in water to make sure.

To escape Zeleny Gai (O'Connor's Last Resort) on the trip back, we drove to Zaporozhe instead. It was here, on a Sunday night, that two teen-age machinist apprentices came up to us on the street and told us elatedly of Sputnik I. Later on, after our return to Moscow, we were approached by four students who had spotted us as foreigners and wanted to talk. I produced a copy of POPULAR SCIENCE with color photos of 1958 U. S. cars. Though calmly proud of Sputnik, the youngsters were frankly envious. "We won't have cars like that for two years," said one student. "Two?" scoffed another. "Ten would be nearer."

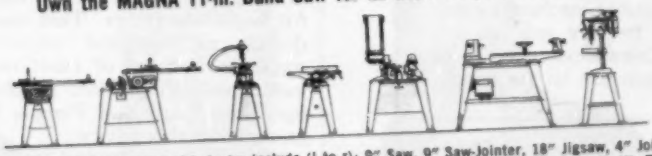
Because we had overstayed our visas, there were hints that we might have some trouble leaving the country. It didn't develop. We were courteously cleared at the Bug River bridge, and bade our guide and friend of three weeks goodbye. There was no inspection. We were allowed to take out all our film, to develop our impressions of Russia back home. END

Why Magna?

—Because MAGNA's new, complete family of superior power tools incorporates the first significant design contributions in over a quarter-century!

HERE'S WHY THE MAGNA 11-IN. BAND SAW gives you more than any other band saw: • *New Ease of Operation* with exclusive Automatic Blade Tracking (quick, safe blade changing!) Single-knob for one-hand adjustment of blade guide height! • *Increased Capacity* — blade offsets to cut any length stock, up to 6" thick! • *Integral Precision* — exclusive Cross-Slot table for precision re-sawing! • *Rugged Durability* — one-piece pressure-cast frame! Basic Band Saw only $79.95, delivered! Mail coupon today for full specifications in *free* Magna-Line catalog.

Own the MAGNA 11-in. Band Saw for as little as $1.54 a week!



MAGNA-LINE tools for home and industry include (l to r): 9" Saw, 9" Saw-Jointer, 18" Jigsaw, 4" Jointer, 6" Belt Sander, Compressor-Sprayer, 30" Lathe, 12½" Drill Press. (Also the new MAGNA Thrifty-Three: 8" T/A Saw, 12½" Jigsaw, 4" Belt Sander).

MAGNA POWER TOOL CORPORATION

World's largest independent producers of power tools

MAGNA POWER TOOL CORPORATION
Dept. 703-S, Menlo Park, California, OR
Dept. 703-S, Box 2808, Fort Wayne, Indiana

Please send me your free, illustrated MAGNA-LINE catalog:

*Name*_____

*Address*_____

*City*_____ *Zone*____ *State*____

® T. M. REG.

Be sure
it's a genuine
CHANNELLOCK

Why? Only Channellock has undercut, interlocking channels that can't slip no matter how tight you grip. Only Channellock has the reinforced tension edge to withstand maximum gripping force. These exclusive features have made the Channellock No. 420 the first choice of skilled mechanics everywhere. So be sure you get only genuine Channellock pliers. Look for the trademark on the handle.

ASK YOUR TOOL SUPPLIER FOR CHANNELLOCK PLIERS — BY NAME

CHAMPION DeARMENT TOOL COMPANY
MEADVILLE, PENNSYLVANIA

What Science Knows About Headaches

[*Continued from page 140*]

itself, but acts by controlling painfully distended arteries.

This substance is extracted from ergot, a parasitic fungus that attacks rye and other cereal plants. For more than a thousand years, ergot has fascinated scientists. During the Middle Ages, ergot-infested rye flour was responsible for a strange poisoning, sometimes called St. Anthony's Fire, which periodically broke out in epidemic form and caused the death of tens of thousands of victims. Some of these unfortunates suffered from frightening convulsions. Others suffered from equally terrifying hallucinations.

In recent years, chemists have separated from ergot an array of different compounds. Some produce convulsions. Others induce hallucinations. One compound, ergonovine, stimulates the contraction of particular muscles, and is used now by many obstetricians.

For migraine victims, the most important ergot chemical is ergotamine. It and a synthetic derivative, dihydroergotamine, are now used for the control of migraine. They are reportedly effective in 80 to 90 percent of cases.

"No other headache remedy of any type," says one authority, "has yet been found to provide such widespread relief."

Drugs are not enough. Although the drugs can stop the pain of migraine in most patients, and ergotamine—usually in combination with caffeine—can often ward off an impending attack, they cannot cure the disease and prevent the painful bouts altogether. This requires some drastic psychological adjustment. For such an overhaul of emotions and outlook, one distinguished psychiatrist; Dr. Spurgeon English of Temple University, has offered this advice:

"This is not a perfect world. Families and friends have many foibles. Perfection is rarely attained, so be satisfied with less. . . . Do not be a slave to the clock . . . You cannot please everybody, so stop trying . . . Be efficient, but not to the extent that perfection becomes a burden . . . Speak up if you want to . . . Approve of yourself . . . And stop feeling so guilty. We are all human beings and we all make errors . . . Give a little and you will get a lot—maybe even a reduction of that pain in your head." END

"Sweetest Music This Side of Heaven"

Guy Lombardo drives MERCURY's New Mark 78

"'Sweetest Music This Side of Heaven' has long been associated with my Royal Canadians, but after driving the new Mark 78, I'd say Mercury could claim it for outboards — on every score."

The secret of the sweet, smooth music of this 70 horsepower engine is in its exclusive six-in-line design, proved by experience to be far superior to any other for high horsepower outboards.

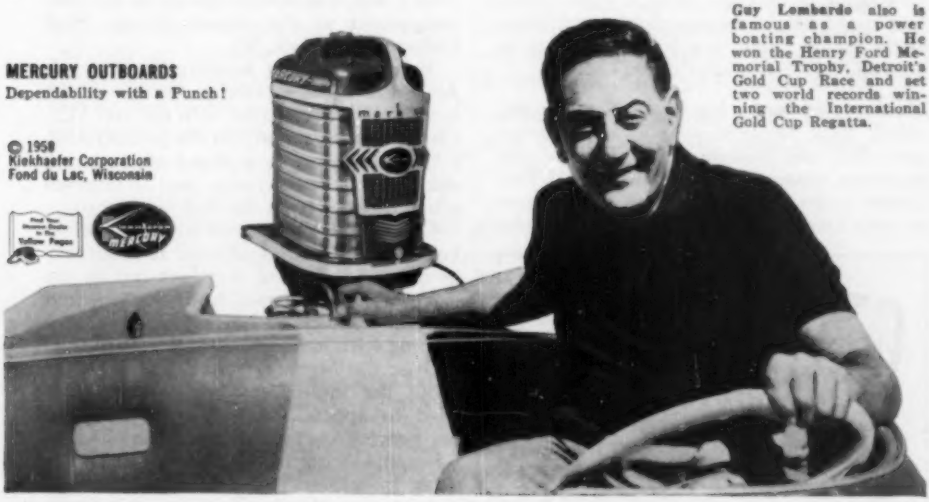
Here is the world's supreme expression of outboard dependability and safety. It's the powerful answer to the public's request for better power for bigger, safer, more comfortable boats. The Mark 78 has more exciting new features than ever offered on any outboard — plus the famous compact Mercury look and colorful styling.

Mercury offers the most that's new for '58 — more *all new* engines, more models, more safety features. See your Mercury dealer soon or write for FREE catalog.

Guy Lombardo also is famous as a power boating champion. He won the Henry Ford Memorial Trophy, Detroit's Gold Cup Race and set two world records winning the International Gold Cup Regatta.

MERCURY OUTBOARDS
Dependability with a Punch!

© 1958
Kiekhaefer Corporation
Fond du Lac, Wisconsin



NEW OAK FLOORING LAYS LIKE TILE
over concrete, wood or old tile floor

Bruce Laminated Oak Block

Modernize your home by installing this beautiful hardwood floor over your old floors. Or use low-cost Bruce Laminated Blocks to create new living space in attic, basement or addition.

Easy to lay — Just apply adhesive (Bruce Everbond Coldstik) and lay blocks. Tongues and grooves assure tight fit. No nailing . . . and no sanding or finishing either, because Bruce Laminated Blocks are completely prefinished at the factory. Your new floor is ready to be used and admired as soon as you lay it.

Moisture-resistant — Blocks are 9″ square and only ½″ thick. The three oak plies are laminated under heat and pressure with waterproof glue to prevent expansion and contraction. Ask your lumber dealer for a cost estimate. Mail coupon for color literature on Bruce Laminated Blocks.

SEND FOR COLOR FOLDER

E. L. Bruce Co.
Box 397-A, Memphis 1, Tenn.

Send complete information on Bruce Laminated Oak Block Floors.

Name_____

Address_____

Bruce LAMINATED Oak Block Floors
By the world's largest hardwood flooring maker

I Flew 1,900 M.P.H.

[Continued from page 163]

off, there had not been an appreciable lessening of my momentum, as deceleration in the rarefied air was a slow decay. It was several minutes later and altitude was below 50,000 feet before the X-2 was subsonic again.

At 30,000 feet now, I did more maneuvers, approaching stall and then pulling up to test dive recovery, but my mind wasn't really on my work. Instead my head was filled with thoughts of the speed I had just attained, faster than any man had ever flown. I felt that I had made a contribution to mankind, a small step forward in aeronautical science—perhaps another step toward the time when men will fly in space.

Although I could not disclose my true speed over the radio for security reasons, I left no doubt that my flight had been a successful one. Congratulatory messages filled my headset, and when my chase pilots picked me up I did a few exuberant victory rolls.

At 20,000 feet we entered the overcast, breaking clear again at 16,000, where below me to the east lay the familiar runways of the dry lake. Waiting down there —as they always had—to see me safely home again, were the wonderful people who had made this flight possible. Also waiting for me, still unseen but felt more keenly than ever, was Avis and home. And I was free now to go on to my new assignment at the Armed Forces Staff College at Norfolk, Va.

Making my last landing at Edwards Air Force Base, I came in lower over the key point, chase planes with me and Maj. Childs talking me in. On the ground now, I touched down in a cloud of dust and skidded to a smooth stop, just 15 minutes after the drop from the B-50 a life ago. . .

Cindy and Vicky were at school when I got home, but five-year-old Kendall was in the yard digging. Avis ran out to the driveway as I jumped from the car, and hugged and kissed me. Her eyes were shining with joy and relief.

Over the luncheon table I still talked about the flight that morning, and she tried to appear interested. But I knew her heart wasn't in it, and after a while I began talking about other things. Besides, the movers were coming tomorrow, and I had to help her do the packing. END

you'll get
more jobs done—
and done better—
with a

PORTER-CABLE ROUTER

The Porter-Cable Router is one of the most useful woodworking tools you can own. With it you can do all these jobs: make decorative edges on table tops, bookcases and shelving; cut outlines for inlay jobs; grooves and rabbets for cabinet work; mortises for door hinges; circles and ovals—all with perfectly smooth edges and much more.

Illustrated here is the famous Porter-Cable Router #100, now with full ⅞ h.p. It is quality built with a non-marking base, precision ball bearings and high-speed, interchangeable motor for Power Plane and Shaper. An outstanding value at only $57.50. Model #162 ½ h.p. Router, $49.50.

See these new professional quality tools at your Porter-Cable dealer today or write for full information.

ROUTER BIT KIT

Contains everything you'll need for hundreds of basic Router applications and jobs. Three high-speed bits and sharpening wheel come in hinged transparent case.
No. PR-138Y Bit kit. . . only $9.95.

PORTER-CABLE MACHINE CO.
8152 Marcellus Street
Syracuse 4, New York
Saws, Drills, Sanders, Routers, Shapers, Planes.

Porter-Cable
Quality Power Tools

In Canada, write Porter-Cable Ltd., Box 5019, London, Ont. Canadian Prices Slightly Higher.

[*Continued from page 168*]

and that nixed the setup as a possibility for fusion power. If hot gas touched the wall, during a fusion reaction in a full-scale furnace, the tube would go right up in smoke.

So things stood, several years ago, in magnetic-bottle trials here and abroad.

What's happened since then?

Although much is still under wraps, there are hints as revealing as this:

"Some of the instabilities which did worry us considerably a year ago are now very well in hand," Congressmen were told in mid-'57 by the AEC's director of research, Dr. T. H. Johnson.

And the most impressive evidence of fusion-power progress is the beginning of big-scale experiments.

Currently the headlines are coming from England, where a doughnut-shaped thermonuclear machine named Zeta has already been in operation for several months. While its dimensions are undisclosed, there are indications that it's a sizable affair. The British experimenters report having attained temperatures of several million degrees—and believe they observed signs of a momentary fusion reaction. At this writing they were trying to confirm it. Such "flashes in the pan," which could occur at a lower temperature than a self-sustaining fusion reaction requires, would consume more power than they yielded; but they would be of great interest as an important step along the way.

In this country, a giant experimental thermonuclear machine, the Model C Stellarator, is scheduled for completion within three years at Princeton, N. J. Its shape and size are secret, but it will be so large that a special building will be required to house it, and an overall size of 100 feet is one unofficial guess. The AEC says it will consist essentially of a tube containing ionized gas, and external coils whose magnetic field will confine the gas, for attempts to heat it to "millions" of degrees and produce a fusion reaction. Auxiliary equipment will include a "huge" generator, power

CLEANS YOUR CARBURETOR
while you drive...

Hard starting, stalling, high gas consumption and poor performance all come from a dirty, gummed-up carburetor. And every carburetor gets dirty—inside. GUMOUT dissolves gum and varnish deposits quickly and completely. You just add GUMOUT to your gas tank every two or three months. It cleans as you drive! There's nothing like GUMOUT. Available at all auto supply stores, or wherever automotive products are sold.

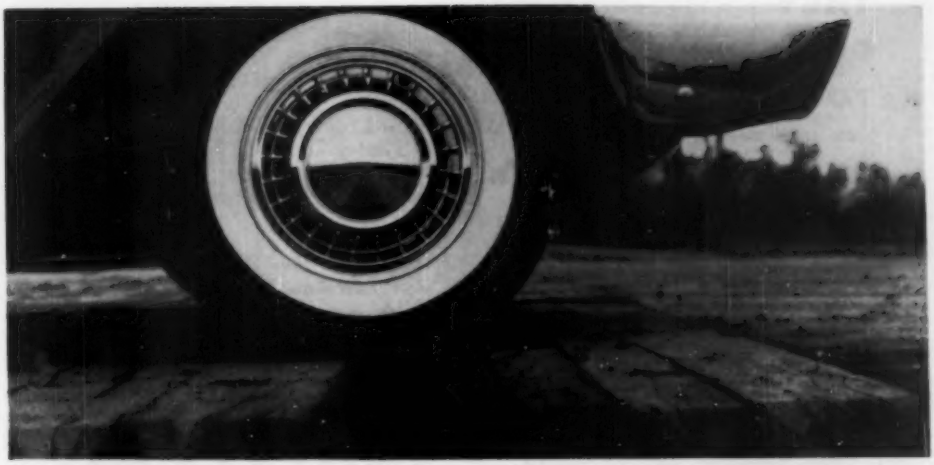
PINT $1.50

8-OZ. 89c

GUMOUT is great for power mowers, too. Insures trouble-free operation, full power.

Write for FREE 46-page Carburetor Handbook.

GUMOUT DIVISION - Pennsylvania Refining Co., 3670 Lisbon Road, Cleveland 4, Ohio



TORSION-AIRE

• WHAT IT IS • WHAT IT DOES • WHY IT IS BEST FOR YOU

Last year Chrysler Corporation proved that America was ready for something new in the way of ride and handling. And Torsion-Aire has given people just what they wanted!

Torsion-Aire is Chrysler Corporation's name for its rubber-isolated, ball-joint, anti-dip, torsion bar system of suspension. And it's unique among American cars. Its design comes from a fresh start, a clean drawing board. It is based on the belief that piecemeal modifications—and design compromises to accommodate optional suspension elements—are no match for a fully integrated, balanced system designed as a *whole*, with the *whole* car in mind.

As a result, it's *the most advanced suspension system yet developed*. No other gives you *all* these important advantages:

• Torsion-Aire is built right into the car. It's not "added on" or "extra". The Torsion-Aire system of suspension was designed for the car . . . and the car was designed for it.

• Torsion-Aire is a complete system. It is designed "in depth" to eliminate your three biggest handling problems. No more starting squat. No more sway on turns. No more braking nose-dive.

• Torsion-Aire is standard equipment on *all Chrysler Corporation Cars*—and at no extra cost. Suspension isn't an accessory you can take or do without. It's as basic to the car as wheels.

• Torsion-Aire is a proven system. Unlike untried systems, Torsion-Aire has been proved by billions of passenger car miles—by more than a million satisfied owners.

Want more proof of Torsion-Aire superiority? Take the Torsion-Aire road test. You don't have to seek out special conditions. With a bump in almost any block—and a corner at the end of it—you can prove this new kind of ride to yourself in the first quarter mile!

CHRYSLER CORPORATION ➤ THE *FORWARD* LOOK

PLYMOUTH • DODGE • DESOTO • CHRYSLER • IMPERIAL

THEY GO TOGETHER

Indispensable to mechanics, machinists, service men, craftsmen . . . these Starrett tools belong in every kit.

No. 565 Series Starrett

DRIVE PIN PUNCHES

For driving cotter pins, drift pins or bolts — also for lining up bolt holes. Made of specially selected tool steel hardened and polished with chamfered heads and knurled grips. Set of eight from 1/16" to 5/16" in round wood box or red plastic case.

3" BENCH BLOCK

No. 129

Handy for driving pins, drilling, heading — also makes an excellent light anvil. Forged, hardened and ground with a smooth finish to protect work and knurled side grip for easy handling. Nine holes range from 1/8" to 5/8".

BIG NEW CATALOG—*FREE*

Describes and illustrates over 3000 Starrett Tools. Send the coupon.

STARRETT TOOLS are carried by leading Industrial Supply Distributors and Hardware Tool Stores.

THE L. S. STARRETT COMPANY
Dept. PS, Athol, Mass., U. S. A.
Please send my free copy of the big new Starrett Catalog No. 27.

Name.....
Occupation.....
Address.....
City.....Zone...State.....

condensers, electronic gear, and vacuum apparatus.

Apparently, with this machine, U. S. scientists hope to bring off the first sustained controlled-fusion reaction.

That would be a feat as memorable as was the achievement in 1942 of the first self-sustaining chain reaction in an atomic pile.

Suppose they do get a controlled-fusion reaction. How would they hitch it up to make wheels go 'round?

You could use the heat to make steam and run a turbogenerator, just as they do now with a fission reactor. It would be grossly inefficient, though, to apply an astronomical temperature just to heat steam a few hundred degrees.

Is there a better way?

The dream is to turn the heat of fusion directly into electricity, in such a way as this:

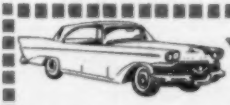
First the plasma is compressed by a magnetic coil. Then, as fusion takes place, heat expands the plasma and drives it outward again. That induces a current, in the windings, which you can draw off for power. Keep repeating the cycle, and you get a steady flow of electricity from fusion. You could compare it to a gasoline or diesel engine, in which the piston compresses the fuel, and then the ignited fuel expands and drives the piston.

Will a fusion-power plant be dangerous? Could it blow up like an H-bomb?

No, because only a tiny amount of deuterium will be in the furnace at any time—just enough to supply the wanted power, and much too little to make a bomb, or stoke a dangerous runaway reaction.

And unlike a fission-power reactor, a fusion furnace would store up no large accumulation of dangerously radioactive fission products, whose accidental escape could imperil a countryside. The only radioactivity of a fusion plant would consist of the extremely short-lived neutrons, and any moderate radioactivity that they imparted to nearby materials.

So it looks as if a fusion reactor should be the safest kind of all. END



You can buy a new car with the money this coupon can save you!

A-15

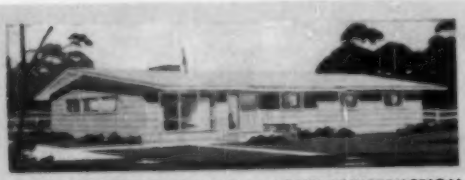
Send 25¢ today for 72-page catalog in color
THE ALADDIN CO.
BAY CITY, MICH.

NAME _____
STREET _____
CITY _____
ZONE ____ STATE _____

ALADDIN READI-CUT HOMES

ARE ENGINEERED TO SAVE YOU THOUSANDS OF DOLLARS!

LOOK AT THE FACTS: Aladdin sells thousands of houses. Because of the huge quantity of lumber used the average builder cannot match Aladdin's prices. And you save on labor. Instead of paying carpenters $20 a day or more you can easily build, or help build, an Aladdin home yourself. Thousands have done it. Please keep one thing in mind: *When you build an Aladdin Home you get the finest quality lumber and materials — shipped to you Freight Paid.* There's a wide choice of modern designs by Aladdin's architects and your finished Aladdin Home will stand comparison with homes priced far above what you pay. That's why thousands of families who must save are buying Aladdin Homes today. *One thing more: Aladdin Homes are in all 48 States — you can see one near you before you buy.* But first send the coupon above for Aladdin's new 1958 Catalog. It will open your eyes to savings you never thought possible! Mail it today!



Noted for HIGHEST QUALITY and BEST CONSTRUCTION

At DELIVERED PRICES that will SAVE YOU MONEY

from $3,000 We pay the freight

110 MODERN FLOOR PLANS
5 to 8 Rooms—RANCH, COLONIAL, CAPE COD, 2-STORY
NOT PREFABRICATED • ALL MATERIALS READI-CUT

Start with a JBL D130—your basic loudspeaker. In no other high fidelity component is precision more important. The D130 is an unquestioned masterpiece of precision, without equal in advanced engineering, meticulous craftsmanship, and accurate reproduction. The JBL D130 is the only 15" extended range loudspeaker made with a 4" voice coil. When the D130 is used alone, this makes for crisp, clean bass; smooth, extended highs. Later, when you advance to the ultimate excellence of a JBL two-way system, add a JBL high frequency unit and dividing network. Then your JBL D130 will serve as a perfectly matched, beautifully balanced low frequency driver.

BUILD YOUR OWN ACOUSTICAL ENCLOSURE

An engineered, solidly built acoustical enclosure is required for satisfactory bass reproduction. You can build your own for your D130 . . . build it to stand alone, build it into a wall or closet, or to fit inside some prized chest or cabinet.

Send for this free booklet which tells how to build a bass reflex enclosure of the size you require.

JBL

JAMES B. LANSING SOUND, INC.
3249 Casitas Ave., Los Angeles 39, Calif.

Send free Reflex Construction Folder and Catalog.

NAME_____

ADDRESS_____

CITY_____ZONE_____STATE_____

Biggest Boom in Music
[*Continued from page 159*]

wind chest and the pipes that it feeds.

The levers are controlled by keys, and when an organist presses one, air rushes through the selected pipe. The pitch of the resulting sound is governed by the length of the air column, while the quality or character of the voice is largely determined by the formation of the pipe end. One type—similar to a penny whistle—has a sharp metal lip that partly blocks the passage and sets the air column into vibration. The sound it produces is quite different from that generated by a vibrating reed in the oboe-like pipe.

This wind-and-whistle principle has been found capable of producing four different families of voices. The distinctive organ sound of air sighing through pipes is known as diapason; interposing a vibrating valve between pipe and air supply adds a tremulous quality. The three other classes of organ voices are called reed, flute and string for the obvious reason that they are imitative of these instruments. Within each family, however, there are almost endless variations—just as there are real flutes of different lengths and string instruments as unlike each other as the harp and the banjo.

As the organ builder's art progressed over the centuries, separate organs were frequently combined into single instruments by the addition of extra ranks of pipes. To bring them under the control of one player, extra keyboards, or "manuals," had to be added to the console. Church organs of recent times have rarely had fewer than three manuals plus a pedal keyboard. When "couplers" were added, any rank of pipes could be played from any keyboard, and several voices could be played simultaneously for ensemble effect.

Because of their great size, complexity and cost, pipe organs were limited for centuries to churches and palaces. Their pipes, accordingly, were fashioned to produce tones of solemn dignity.

Now, since most pipe-organ voices are only imitations, it follows that there must be other ways—possibly better—to produce these sounds. Among the more practical means is the reed-organ principle in which compressed air is used to vibrate thin blades or reeds. Each key of a reed-organ manual controls a valve. Pressing

10:05 A.M. The test begins. The B&D Saw will be tested on 2" lumber, making a variety of cuts.

4:00 A.M. It's 18 hours since the test began. Over 4000 ft. of lumber cut so far.

8:30 A.M. Over 22 hours and a third crew of men is on. 13 blades have been used.

Test runs through the night. After 24 hours, saw was still going strong. It was then put on laboratory testing machine to continue test* for 6 more days and nights.

7-DAY SAW TORTURE TEST PROVES BLACK & DECKER TOO TOUGH TO BEAT!

Hour after hour, day and night—for one week, a Black & Decker Saw was tested continuously by the United States Testing Company, Inc., Hoboken, N. J. This saw received more wear and tear than most saws ever get in a *lifetime of use*.

And the saw stood up! After seven grueling days and nights, every part of the saw was found to be in perfect condition. Here is proof of Black & Decker quality... why we say Black & Decker Saws are tough enough for any job! THE BLACK & DECKER MFG. CO., Dept. S028, Towson 4, Md.

**United States Testing Company, Inc., Report No. 37135, Nov. 27, 1957.*

Black & Decker®

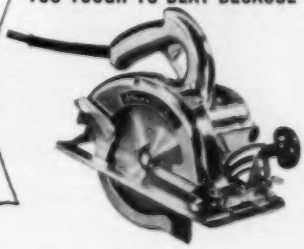
World's Largest Maker of Electric Tools

Find Your B&D Dealer in the 'Yellow Pages'

Look under "Tools-Electric"

NEW LOW PRICES
IN TIME FOR
SAWTIME '58
SEE YOUR DEALER NOW

TOO TOUGH TO BEAT BECAUSE OF THESE FEATURES:



- Easier Handling
- More Power
- Proved Ruggedness
- Better Visibility

a key allows inrushing air to flutter the appropriate reed.

Like church organs, most reeds of the last century were built with reverent voices, and the two types shared still another characteristic: They had an appreciable time lag between the pressing of a key and the sounding of a tone. Added to the religious associations of the instrument, this slow response tended to limit organists to the performance of sacred—or at least stately—music.

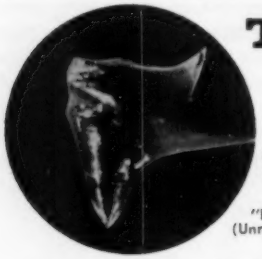
Thus while the modern organ can trace its lineage back to ancient pipes and reeds, its marriage to popular music took place only a generation ago. Many observers believe that it was the nickelodeon that brought them together. In the days when dialogue was printed on the screen, it was considered necessary to supply musical sound effects and accompaniment. Thus larger theaters turned to organs.

"Mighty Wurlitzers" (named for their innovator and principal maker) filled picture palaces with sound. The organs were specially built to give fast key response and highly theatrical effects. The Wurlitzers' showiness came, literally, from pulling out every stop. Extra degrees of vibrato were added, and new pipes created to simulate such unchurchly instruments as the saxophone and trombone. A variety of instruments that couldn't be imitated (such as snare drums, xylophones, and marimbas) were actually built into theater lofts and connected to the organ consoles.

The enormous bounce and musical variety of these theater models added new dimensions to organ music and created a wide and enthusiastic following. They have also influenced the selection of voices and special effects built into most electronic organs.

Whether it's because of these new sounds, or their more traditional voices, modern organs are clearly riding a boom. The fact that most people (97 percent according to one survey) find organ music pleasant is expected to help. So is the snowballing effect that comes from increased exposure on radio, television, hi-fi recordings and in the home.

Convinced that the trend is leading



The difference can ruin your records!

Enlargement of "bargain" stylus. (Unretouched photo)

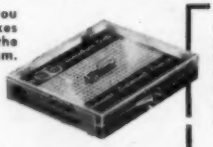
Enlargement of genuine G-E diamond stylus. (Unretouched photo)

INSIST ON A GENUINE GENERAL ELECTRIC REPLACEMENT STYLUS

A G-E replacement stylus is a precision-engineered assembly, designed and built by the same people who developed the famous General Electric cartridges. The diamond tips are painstakingly ground. Specially formulated damping blocks do not "fatigue" with age. Positioning of these blocks has been precisely calculated to bring you the smoothest possible frequency response.

General Electric replacement styli are manufactured *only by G.E., for G-E cartridges.* Don't take a chance! Insist on a factory-sealed box clearly marked with the G-E monogram. Sold by leading dealers. Mail coupon for free booklet.

All G-E styli come to you in factory-sealed boxes clearly marked with the General Electric monogram.



General Electric Company PS258
Specialty Electronic Components Dept.
Section HF, West Genesee Street
Auburn, N. Y.

Please send me your free illustrated booklet on genuine G-E styli and cartridges.

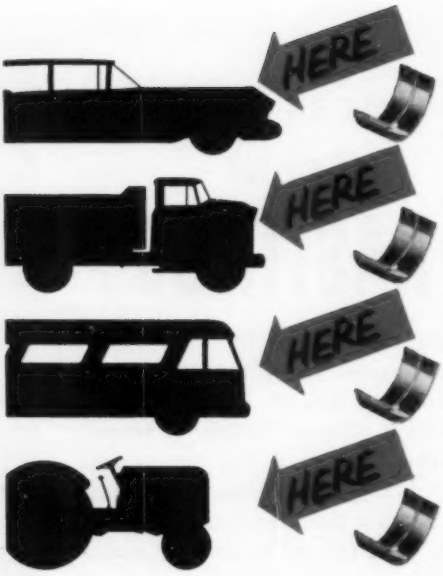
Name _____

Address _____

City _____ Zone _____ State _____

GENERAL ELECTRIC

For clean oil all the time
call for
HASTINGS
Only Hastings Oil Filter Cartridges keep oil clean *all the time*, because only Hastings has Densite filtering material.
Densite is different! Millions of selected cotton fibres—pressure packed—trap even the most microscopic dirt particles. Only Densite keeps oil clean from filter change to filter change, when replaced as normally recommended.*
Next filter change, call for Hastings—for clean oil *all the time!* Hastings Manufacturing Co., Hastings, Mich. Also makers of Piston Rings, Casite, Wear Reducer, Spark Plugs.
*Proved by tests conducted in accordance with U.S. Bureau of Standards procedures.
HASTINGS
OIL FILTER CARTRIDGE
KEEPS OIL CLEAN
NO. 101
U. S. Patent No. 2,797,811



In engine reconditioning

FEDERAL-MOGUL *means*
FINE PERFORMANCE!

Any engine will perform better when reconditioning includes Federal-Mogul bearings. They are *engineered* for the job. If the crankshaft has to be turned down, there are Federal-Mogul bearings in the correct undersize to fit it. Federal-Mogul reborable bearings can be align bored. For heavy-duty jobs, Federal-Mogul sintered copper-alloys are the answer. That's why mechanics PREFER Federal-Mogul bearings . . . they are designed to restore fine performance. Ask *your* mechanic!

Biggest Boom in Music

straight up, several manufacturers have expanded production and others have entered—or re-entered—the field. At least one firm offers a build-it-yourself kit of parts, others feature piano-organ combinations and organ attachments for piano keyboards.

One of the newest instruments to appear is based on a unique voicing system different from any of those mentioned above. Instead of generating organlike signals, the California-made Chamberlin uses tape recordings of individual notes taken from a wide variety of instruments. These realistic sounds play back when you press the appropriate keys. Other prerecorded tapes are provided for bass chords and special effects.

The swelling voice of electronic organs has been likened to the musical upsurge that put tens of thousands of reed organs —or harmoniums—into American parlors during the last half of the 19th century. But unlike the parlor harmonium—which filled an entertainment void in many isolated farmhouses—the electronic organ is successfully rivaling countless other diversions available in the home or a short car-hop away.

And there's another notable difference. The reed organ was commonly the focus around which the family would gather for hymn singing or just plain recreation. Though everybody joined the singing, there was usually just one who could play.

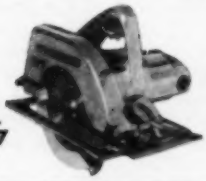
The electronic organ is a focus, too, but it is more often played by several members of the family. The ease of operation that has made this possible is undoubtedly the biggest factor in its sudden rise.

The love of music that most people have has been lavishly fed by radios, phonographs and a variety of other devices. The new organs, however, cater to what may well be a still more fundamental need—self-expression through musical creation. The playing of music has ceased to be a private and limited preserve.

Electronic organs, to be sure, offer many challenges to trained musicians. But their most enthusiastic fans are like the lady in Port Clinton, Ohio, who wrote to a manufacturer: "It has opened up a whole new world for the entire family. At present we are beginners, and can only play picture music, but it's wonderful and we love it." END

Here's the most advanced saw line on the market today!

No. 747
7¼"



No. 727
7"

No. 626
6½"

Millers Falls ALL-NEW line of
FULL-POWER SAWS

Four all-new, deep-cut models, loaded with exclusive features and Millers Falls traditional high quality. You'll find here a saw for every job — and every budget; with more power per pound than any others on the market. Two heavy-duty models feature quick-change integral depth and angle adjustments, safety window, exclusive Micro-Guide, and full 2 h.p. motors. Two new standard-duty saws have 65% power boost over previous models, with professional features and performance that make light work of 90% of all sawing jobs. All are rugged, lightweight, perfectly balanced — and at prices unmatched for this quality. See them at your dealers today!

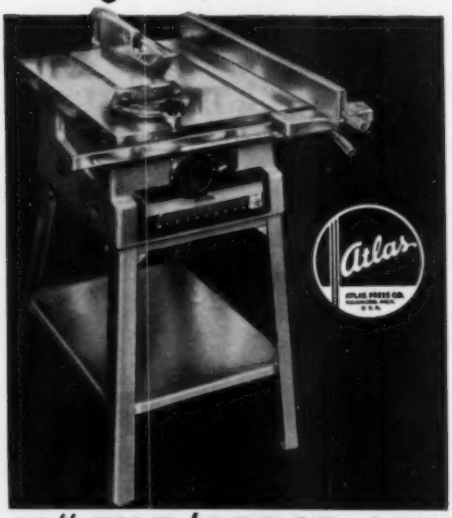
HEAVY DUTY
No. 800 - 8¼" . . . . only $95.00
No. 747 - 7¼" . . . . only $84.50

STANDARD DUTY
No. 727 - 7" . . . . . only $74.50
No. 626 - 6½" . . . . only $54.50

MILLERS FALLS CO. • Dept. PS-23 • Greenfield, Mass.

FINEST HAND AND POWER TOOLS MADE FOR HOME AND INDUSTRY

DOLLAR for DOLLAR Atlas Gives you Greater Value!



10" TILT/ARBOR SAW

The Basic Tool for Home Shops

With this precision Atlas tilt/arbor Circular Saw you can do almost every basic woodworking operation . . . faster, more accurately and with maximum safety. It rips and cross cuts lumber to size — cuts angles, bevels — and with attachments it dadoes, handles straight shaping operations — more accurately and efficiently than any other type of power saw.

Atlas 8" and 10" tilt/arbor saws have ground grey-iron tables, sealed-for-life ball bearings, patented quick-positioning double locking fence, grip-form mitre gauge, dual-control handwheel. The new structural box mechanism of the cradle and arm holds the blade in rigid alignment at every height, angle and cutting load (an Atlas exclusive . . . the most significant advancement in saw design in two decades). Unexcelled for general carpentry, these great new Atlas saws also give you the accuracy you need for fine cabinet work, built-ins, trim and furniture projects. See them and compare before you buy any saw!

Write FOR FREE CATALOG

Atlas Press Company

2-25 N. PITCHER ST., KALAMAZOO, MICHIGAN

The Robot That Runs a Railroad

[*Continued from page 117*]

of its closed positions to the other."

"Say a chunk of ballast works up between the points and the backing rail, so the switches won't close?"

"***That's CTC's second job.*** I've just told you how we use code signals to operate the switches and lights out here. But a second set of signals must go back to the control board to show that the field location has done its work. In the case of an open switch you're dealing with another transmission system called an 'audio frequency overlay.' "

"Come again?"

"Well, let's make it sound simpler than it is. At every block-signal location we send a tone signal through the rails. Now imagine a hi-fi-minded relay listening tight-lipped to this concert. When a switch isn't fully closed the tone signal goes sour and the hi-fi relay drops its jaw. That opens a circuit and the field location passes the word along to the dispatcher by refusing to give him a switch-position light on the machine. Then it's up to him to call the nearest maintainer."

Three streamliners and one redball freight later, we were back in the CTC office at Perry, watching relief dispatcher Bill Kelly plot his meets on the master keyboard.

"This CTC machine," he told us, "was actually built on the installment plan. The cabinet I use to handle trains for the first 60 miles out of Council Bluffs went into service first, at a station called Manilla. Then we put in the one at my right, for movements between Green Island and Marion Yard, near Cedar Rapids. When we closed the gap between them with the board in front of me, we had a problem—how to keep traffic rolling while we brought the small machines into Perry."

"That's when the signals-and-communications department made it easy for you train delayers," McConahay cut in. "We had our new carrier system all ready to tie on. Then we hooked temporary extension lines to the machine at Marion, waited for an open spot in traffic, and loaded it aboard a baggage car. A dispatcher climbed in after it and went on putting his trains across the road until a second traffic lull gave us a chance to cut the wires and high-tail the baggage car to

Get smooth, seamless walls with Gold Bond Gypsum Wallboard and Tape System

You can have expertly finished walls by following this simple procedure. Just nail Gold Bond Gypsum Wallboard to wood framing and treat the panel joints with Gold Bond's easy-to-use Perforated Tape Joint System. One package contains all the joint materials you need for the average room . . . including the bedding knife. Here is how it works:

APPLY CEMENT. Fill each channel formed by edges of tapered-edge wallboard with Gold Bond Joint Cement.

EMBED TAPE IN CEMENT. Center Gold Bond Perforated Tape in channel and embed in cement, using 4" putty knife.

SMOOTH DOWN CEMENT. Smooth down cement forced through tape perforations. Cement all nailheads.

FIRST BEDDING COAT. After 24 hours, apply thin coat of cement and feather out 3" to 4" on each side of channel.

SECOND BEDDING COAT. When cement is dry, apply second thin coat. Feather out 8" to 10". Give nailheads second coat.

SANDING. After 24 hours, sand cement level with wallboard surface. Sand lightly—don't scuff paper surface.

PROJECTS GET DONE FASTER, EASIER with Gold Bond Building Products—because *they're made together to work together.* Insist on the best...ask for Gold Bond® Gypsum Wallboard and the Perforated Tape Joint System. Send 10¢ for plans of room illustrated, a list of other room plans available and additional wallboard information. Write to National Gypsum Company, Dept. PS28, Buffalo 2, N. Y.

Gold Bond
BUILDING PRODUCTS

NATIONAL GYPSUM COMPANY

"Build Your Own"
gas drive portable
ARC WELDER
SAVE $200 to $300

A surprisingly low investment puts you in the profitable welding trade. Couple a top performing Hobart generator with a good used auto engine and you're in business with a portable arc welder that lets you weld anywhere, any time.

1

Earn MORE!

Hundreds of opportunities exist in the welding field. Lets you go after the profitable outside jobs. Get started today and cash in!

"Husky Boy" air-cooled arc welder

Welds anywhere. Easily mounts on truck or trailer for getting to those profitable emergency repair jobs. Light, rugged, compact and air-cooled. Fine for fabrication purposes and tough enough for continuous operation on light or medium production work.

2

AC welder—AC power

200 amp. combination that you can connect to your own power source. Lets you operate where no power lines are available. Furnishes current for welding and power for running tools, lights, motors, etc. Build your own combination welder and power unit with a good used auto engine.

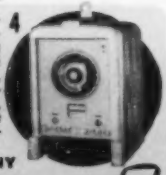
3

utility AC shop type welder

Welding Lessons 200 pages fully illustrated Self-teaching $1.00

Superior performance, economical operation and general serviceability make this a popular model for small shops, implement shops, auto service shops, plumbing and heating contractors, farm welding, etc. Has same features as the big industrial models.

4



HOBART BROTHERS COMPANY
Box P-28, Troy, Ohio. Ph. FE 2-1223

HOBART BROS. CO., Box P-28, Troy, Ohio
without obligation, send me complete information on:
☐ 1. "Build Your Own" ☐ 2. "HUSKY BOY" Air-Cooled
☐ 3. A.C. Welder—AC Power ☐ 4. Shop Type AC Welder
Name_____
Address_____
City_____ State_____

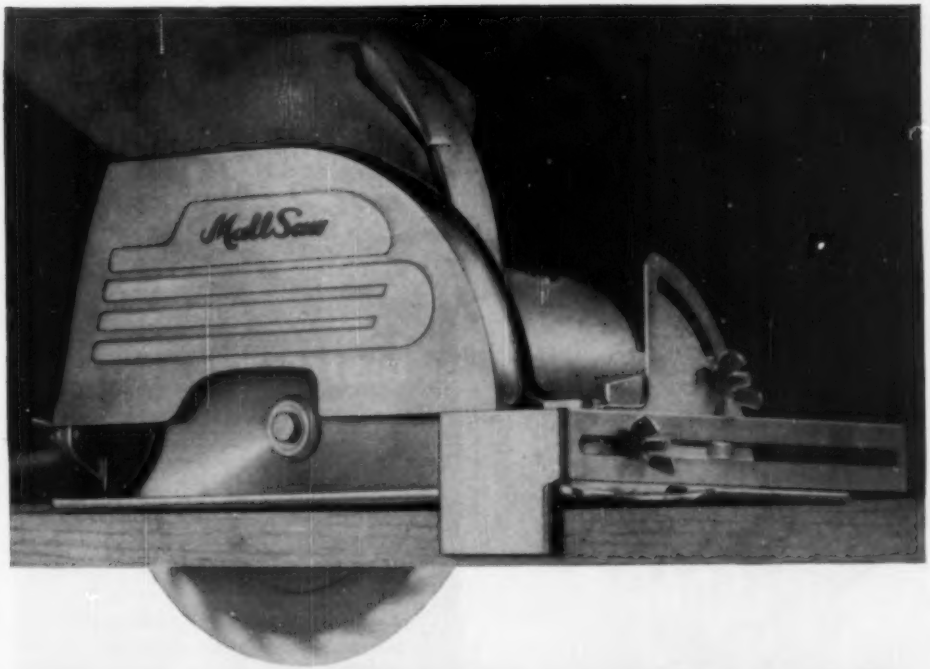
Perry. The machine was back in business in a couple of hours. At Manilla we were able to make a transfer without the baggage-car hookup."

Like castanets, for the next six hours the relays behind the panels clicked steadily. Outside the office, unseen by Bill Kelly, a continuing parade of long yellow passenger trains poured in and out of Perry. Three of them, the "City of Denver," "City of Los Angeles," and "City of San Francisco," eastbound, chased each other across the board in the form of tiny lights that were rarely more than two reporting stations apart. "The minimum air cushion between those babies is four minutes," Kelly said.

Intermixed with the streamliners were the hardworking freights. The voices of trainmen with cars to set out and pick up on sidings came booming through a loudspeaker, requesting signal protection and the authorization to unlock hand-thrown switches. Each time, Kelly checked his board. If the move could be made without stabbing traffic, he flicked his levers and punched the right actuating buttons. As a further precaution, he slipped little composition tags over the buttons to lock them. He didn't remove them until he got a second call, advising him that the switching movement was complete.

Backing up Kelly, J. D. Galiher, night chief dispatcher at Perry, came in a dozen times for a look at the ribbons of tape that inched along below rows of magnetically controlled pens in front of each machine. As trains progressed across the division, they actuated the pens, one by one, and tiny jots appeared upon the ribbons. When Kelly connected the dots with his fountain pen, diagonal lines, moving toward each other, showed him where east- and westbound trains would meet, and when. He set his passing-siding switches and signals accordingly.

By dawn it was clear to us that Centralized Traffic Control is an infallible railroading robot. But it's a robot that makes stern demands upon its human co-workers. The real plaudits go to the McConahays who keep it healthy, and the Kellys who must make split-second decisions each hour of the day and night to take full advantage of CTC's amazing traffic potential. END



POWER

Remington 7-inch circular saw gives you an extra deep cut with power to spare!

Ideal for home workshop or maintenance. Model 71 has depth capacity of full 2¾″ at 90°; will cut through 2″ lumber at 45°; speed: 5000 rpm. Powerful 25-60 cycle motor rated at 8.4 amps. Telescoping blade guard; one nut adjusting depth and bevel shoe; ball and self-lubricating bearings; weight: 8¾ lbs. 10-ft. cord, plug and ground; blade and wrench included. Ask your dealer to show you this powerful saw—it's your biggest saw value!

TWO MORE POWERFUL REMINGTON TOOLS

Sturdy ¼″ drill.
Model 149B, complete, $28.50*

Rugged belt sander.
Model 31, complete, $89.95*

Remington Mall®

MALL TOOL COMPANY
Division of Remington Arms Company, Inc., Bridgeport 2, Conn.
In Canada: Mall Tool, Ltd., 36 Queen Elizabeth Blvd., Toronto, Ont.
**Specifications and recommended list prices subject to change without notice. Prices slightly higher in Canada.*

Mail this coupon today!

FREE 16-PAGE CATALOG shows every type of Remington electric tool by Mall. Tells what each will do—gives prices and specifications. No cost, no obligation. Just send in this coupon.

MALL TOOL COMPANY
Division of Remington Arms Company, Inc.
Bridgeport 2, Connecticut

Please send me FREE ILLUSTRATED CATALOG

NAME_____
ADDRESS_____
CITY_____ ZONE_____ STATE_____

It's like employing your own personal mechanic to keep your engine always at its best

The superior lubricating qualities of Kendall SuperB mean less wear, less need of repair. Oil and gas mileage go up. Noise level goes down. Driving is more economical, more enjoyable with this All-Weather SAE 10W-30 oil refined from 100% Bradford Pennsylvania Crude Oil—richest in the world.

Ask your favorite dealer for it now

KENDALL REFINING COMPANY
BRADFORD, PENNA.

DON'T THROW IT AWAY — FIX IT WITH

Plastic Steel 80% STEEL

AS EASY TO USE AS MODELING CLAY. Hardens in two hours — holds permanently. Can be filed, sanded and painted. PLASTIC STEEL bonds iron, steel, brass, aluminum, wood, concrete, etc., to itself or each other.

LEAKING RADIATOR? — PLASTIC STEEL mends radiators, pipes, tanks and appliances in minutes. No special tools needed. Requires no heat or pressure — will harden under water.

CAR REPAIRS — Save money on auto repairs with PLASTIC STEEL. Fix torn fenders, cracked engine blocks, leaking gas tanks.

PLASTIC STEEL has a million uses around the home, garage or farm. *Convenient home kit* — 98c, $1.89 and $3.95 AT LEADING HARDWARE STORES.

DEVCON CORPORATION
180 ENDICOTT STREET, DANVERS, MASS.

your name here and you're in business!

Put spare time to profitable use by selling "your own brand" automobile polish. Made by a firm with a more-than-50-years' reputation for quality products, the polish is absolute tops in making a car gleam—as you can convince any prospect in a moment's easy demonstration.

Start as small as you wish, make your business as big as you feel you can handle . . . *you're* "the boss" in every way. Polish moves fast and profit is surprisingly high. And you can have an exclusive territory—an ideal setup with repeat orders so certain. For sample and sales details, write

C. P. Baker & Co., Dept. 1-A, 501 N. 11th St., Philadelphia 23, Pa.

OLDSmobility

The new way to travel that takes you out of the ordinary into the Rocket Age!

. . . and engineered for excellence throughout!

Oldsmobile for 1958 is engineered to be both rugged and right! For its new Rocket Engine is writing this year's big economy news . . . with multiple engineering advances that boost efficient action to a brand-new high! Just try it and see how new camshaft design . . . new manifold design . . . 10-to-1 compression ratio . . . all combine to make the '58 Rocket the road's most talked about performer!

Even comfort's calibrated to the *n*th degree in Oldsmobile . . . with exclusive New-Matic Ride*! For here is *true* air suspension. Four air cushions of tough rubber-nylon give you a variable rate ride, smooth and level whatever the road or load! It's a "closed system", too, meaning dependable performance with minimum upkeep.

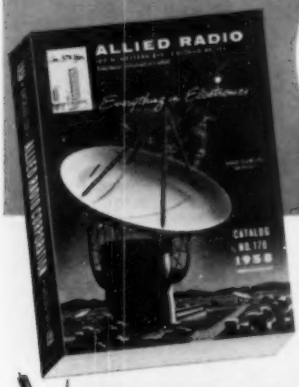
And wait'll you see the brilliantly engineered accessories . . . like Oldsmobile's all-transistor Trans-Portable Radio*. It's actually *two* radios in one. With its own speaker and 160-hour batteries, the Trans-Portable plays inside or outside the car.

Wherever you go, you go with extra value in an Olds . . . with such features as Safety Plate Glass all around! Clearly the '58 Olds is a car in a class by itself! But judge for yourself . . . as your own test driver . . . in a Rocket road test soon!

*Optional at extra cost.

OLDSMOBILE DIVISION OF GENERAL MOTORS CORPORATION

Free! ALLIED'S 1958 ELECTRONIC SUPPLY CATALOG



404 value-packed pages

Send for it!

SAVE on everything in electronics

EASY TERMS AVAILABLE

WORLD'S LARGEST STOCKS

Here's everything in Electronics for Experimenters, Builders, Amateurs, Servicemen, Engineers and Hi-Fi Hobbyists:

- Amazing Build-Your-Own KNIGHT-KITS
- Hi-Fi Music Systems & Components
- Recorders & Phono Equipment
- TV Tubes, Antennas, Accessories
- Public Address Systems
- Amateur Station Equipment
- Latest Test Instruments
- Industrial Electronic Supplies
- Parts, Tubes, Transistors, Tools and Books

SAVE on everything in Electronics —get fast, dependable service— send today for your FREE 1958 ALLIED Catalog.

Everything in Electronics From One Reliable Source

our 37th year

send for FREE Catalog

ALLIED RADIO

ALLIED RADIO CORP., Dept. 112-B8
100 N. Western Ave., Chicago 80, Ill.

☐ Rush FREE 1958 ALLIED 404-Page Catalog

*Name*_____

*Address*_____

*City*_____ *Zone*_____ *State*_____

SAVE 40% 4 Wheel Drive Hubs

• Stop Front End Wear • Steering Becomes Easier • Makes Tires Last Longer • Cut Costly Repair Bills • Reduce Engine Wear • More Power — Save Gasoline

FLEET COST PRICES

Make and Model	Set. No.	Net Price
Willy's Jeeps All Models	J-5	$47.50
Chev. ½ Ton 3100 Series	C-75	$49.50
Chev. ¾ & 1 Ton 3600 & 3800 Series	C-85	$49.50
Dodge Power Wagons Prior 1957	D-10	$49.50
Dodge W 100 and W 200 Series	D-95	$49.50
GMC ½ Ton 100 Series	G-15	$49.50
GMC ¾ Ton 150 Series	G-20	$49.50
IHC A & S 120 Series	I-25	$49.50

Save $2.50 per set by ordering 3 sets or $5.00 per set by ordering 6 sets. Only a partial listing shown above. Available for all 4-wheel drives. Catalogues, Folders, Prices on request.

Order from your local Automotive Jobber or write direct to:

DUALMATIC PRODUCTS CO., LONGMONT, COLO.

DRAINS cellars, cisterns, wash tubs; IRRIGATES - CIRCULATES - SPRAYS

Type P Pump has 1,001 uses. Up to 3,000 GPH: 450 GPH 80' high; or 1800 GPH from 25' well. Use 1/6 to ¼ HP motor. Coupling included free. 1" inlet; ¾" outlet. Stainless shaft. Won't rust or clog! Heavy Duty Ball-Bearing Pump. Up to 7,500 GPH. 1½" inlet; 1" outlet. $7.95 $12.95

Postpaid if cash with order. Also other sizes, types.

MONEY BACK GUARANTEE.

LABAWCO PUMPS, Belle Mead 3A, N. J.

Lowest Price WATER SYSTEM Completely Automatic! $49.95 less motor. With ½ HP motor, $69.95. Bronze Gear Pump 275 GPH. 20-40 lbs. ¾" fittings. Free Circular

2-PASS. SPORT CAR

Ideal 2nd Car or Sportabout. Fully Equipped. Write For Literature.

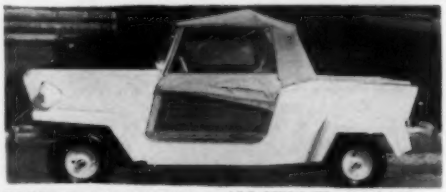
ESHELMAN TRACTORS LOW AS $99

Plows-Cultivates-Saws Cuts-Dozer-Harrows Hauls - Snow Plows-Rolls. Eshelman Tractors, Tillers, Riding Rotary Mowers for Better Lawns and Gardens. Advertised in GOOD HOUSEKEEPING. Thousands of satisfied users. Write for Free Literature.

Illus. MODEL $549.75

Dept. 305, ESHELMAN, Balto. 2, Md.

Shipping Points: BALTIMORE • CHICAGO • RENO



KING MIDGET ALL NEW. First model change in six years. New bodies, new chassis, new engine. Four wheel hydraulic brakes. Still World's Lowest Priced Car. Drive it for 75¢ per week. Rider Agents Wanted. Earn your own car. Get the facts. Send 25¢ for 32 page picture book with complete details, dealers price, etc. if there is no dealer near you.

MIDGET MOTORS CORPORATION, Athens 2, Ohio

New . . . Safe . . . 5-in-1 Tool!

PERMA-GRIT WHEEL

SAWS, DADOES, SHAPES, SANDS, PLOUGHS

This amazing abrasive wheel is the safest and most useful accessory ever designed for table and radial saw use. It's actually 5 tools in 1! Saws, sands, shapes, dadoes and ploughs. And you never change the blade. With tungsten carbide grit permanently bonded on edge and sides, it's the slickest cutting blade ever developed. Cuts and sands wood or composition material in one operation! Even cuts laminated sheets without "pull outs." Coarse grit (36) bonded to edge and one side; other side has medium grit (80). And with no teeth to snag or drag, the Perma-Grit Wheel is safe. No kick-back . . . will not throw wood. One 8" Perma-Grit Wheel with ⅝" arbor. Five tools in one, only $12.95.

PERMA-GRIT HAND SANDER—Outlasts hundreds of sandpaper sheets. A complete kit includes 1 Hand Sander, 1 Medium-Grit Sheet and 1 Fine-Grit Sheet only $3.45.

PERMA-GRIT FILE—Full 14" blade size has coarse grit on one side and medium grit on other side. Unlike other rasps, the Perma-Grit File resists loading. Only $2.25.

SKIL Corporation, Dept. PIC-28
5033 N. Elston Ave., Chicago 30, Ill.
In Canada: 3601 Dundas St. West, Toronto 9, Ont.

Gentlemen:
Please send me complete information on Perma-Grit products.

*Name*_____

*Street*_____

*City*_____ *Zone*____ *State*_____

8" TILT ARBOR SAW
1957 MODEL—BELOW COST!

BLADE TILTS—TABLE REMAINS LEVEL

Less Blade

Heavy duty all cast iron and steel construction. Precision ground cast iron table. Price includes massive cast iron mitre gauge and patented motor drive that fits any motor. Cross cuts, rips, bevels, mitres, dadoes, cuts compound angles — everything expected of saws costing four times as much. Depth of cut adjustable; 0" to 2¼" — table always level. Send check or M.O. $1.00 deposits on C.O.D.'s.

SPECIAL BARGAIN — This saw is our 1957 model. Each saw is brand new — sent to you in factory sealed cartons. Sold and guaranteed direct from the factory to you at a fantastic bargain.

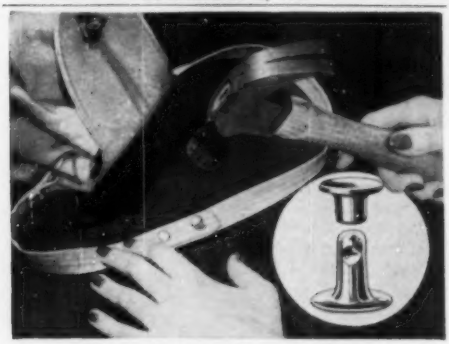
FREE 10 DAY TRIAL — MONEY BACK GUARANTEE

Try this famous saw 10 days. If you are not satisfied that it does the work of any tilt arbor saw, regardless of price, return for immediate money back refund.

Sent Express Collect

We reserve right to refund money if stock is exhausted

AMERICAN MACHINE & TOOL CO.
ROYERSFORD 2, PA.



Repairs in a Jiffy
with DOT *SPEEDY RIVETS*

Literally hundreds of uses! Make or mend luggage, footwear, clothing, household utensils! Quick, easy fastening of cloth, leather, plastic, thin metals! A simple swat with a hammer does the trick. Speedy Rivets are available in 2 sizes. Only 15¢ per card. At hardware counters most everywhere.

Ideal for teen "hardware" belts!

look for the DOT on the package

COLUMBIA FASTENER CO.
3229 S. Ashland Ave., Chicago 8, Illinois
Subsidiary UNITED-CARR FASTENER Corporation

NEW SURPLUS

Full 1-Year Guarantee

HOMELITE "Carryable" GENERATING PLANT

2000 WATT 60 CYCLE, **$189.00**

Single Phase, A.C. 115 Volt

Carrying handles for easy portability. Fits easily in car trunk

Gov't. Cost $500.00

Save Hundreds of $ $ $

PAYS FOR ITSELF! Saves time, labor and money. Provides on-the-spot power for CONSTRUCTION, etc. where none is available or expensive to run in. LARGE ENOUGH for Floodlights; Saws; Pumps; and many more labor-saving, heavy-duty machines. Ideal as a stand-by emergency power plant to duplicate house current. Plenty of power for lights, refrigerator, deep freeze, oil burner, radio, etc. Specifications below CAN'T BE MATCHED anywhere at this price!

GENERATOR 2000-2200 Watts, 115 Volts, 17.3 Amps., 60 cycle, single phase, AC. Overload capacity well above its rated output. Excellent *automatic* voltage regulation plus Field Rheostat for even closer adjustment. Built-in Volt Meter.

ENGINE Famous Homelite single cylinder engine. Air cooled; two cycle. Easy rope start. Dust and rain-proof ignition system. Built-in automatic governor. Foolproof pressure vapor lubrication system. Adjustable jet-type carburetor.

This Precision power plant has ball and needle bearings throughout and costs only 3c an hour to operate. Satisfaction Guaranteed. Weighs 117 lbs. Overall dimensions: 24" long x 17" wide x 17" high

SUPPLY LIMITED! IMMEDIATE DELIVERY! ORDER FROM AD

FREE Catalog of War Surplus—Wholesale Equipment

ROBERTS ELECTRIC CO., Dept. PS-756, 849 W. Grand, Chicago 22, Ill.

NEW, IMPROVED CALCULATOR FOR WOODWORKERS only 25¢

Instantly gives information on lumber, nails, concrete mixes, painting materials, etc. Convenient, simple to read. Just set dial for nail specifications, to convert linear to board feet, find bit sizes for screws, compare characteristics of woods. 6" diameter heavily varnished cardboard. Send 25c, no stamps, please to Greenlee Tool Co., 2122 Columbia Avenue, Rockford, Illinois.

BUY DIRECT • SAVE ON • TILLERS • TRACTORS

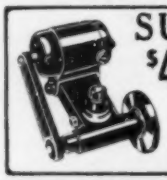
5-6-7-9 H.P 2 wheel &

4 wheel tractors

Full line of attachments for mowing, gardening, farming 2-3-4 H.P. TILLERS 12" 16" CUT.

FREE CATALOG & PRICE LIST

RED-E TRACTOR CO.
RICHFIELD 2—16th ST., WIS.



SURPLUS SALE

$49.50 Less Grinding Wheel

NEW TOOL POST GRINDERS REGULAR PRICE $125.00

1-6 H. P. MOTOR

TAKES WHEELS UP TO ½" x 4"

EXTRA DRILL EXTERNAL OR INTERNAL $19.50

MONEY BACK GUARANTEE

EDWARD J. NOLAN, PULASKI, NEW YORK

BOAT KITS

BUY DIRECT... SAVE 2/3! NO DEALERS - FREE FREIGHT

SAVE... on the Finest Quality Boat Kits. Lowest Prices, Mahogany Decks, Frames, Prams Racers, Cruisers, Runabouts. Over 40 Models of simple to construct boats and frame kits.

SEND 10¢ FOR NEW COLOR CATALOG.... Boats, Paints, Hardware, trailers, fiberglass etc. Over 2000 items for your boat.

BUY ON EASY CREDIT TERMS

Boat Plans-Patterns-Frame Kits

Craig Craft
Tonawanda, N.Y.

Build over 50 modern boats from large scale plans, available with FULL-SIZE patterns, new PRE-FAB frame kits! All types: prams to cruisers, 6 to 25 ft. Best buy for Amateurs! SEND 10¢ for CATALOG.

easier, faster, more fun . . .

Projects for your home made with

REYNOLDS

DO-IT-YOURSELF

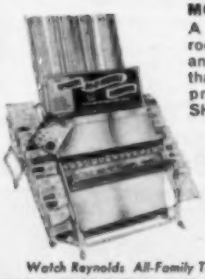
ALUMINUM

These are just a few projects you can make for your home with Reynolds Do-It-Yourself Aluminum—there are hundreds more. They're easy—they're fun—and ordinary woodworking tools are all you need. These free project sheets, and many more, are at your nearby hardware or lumber dealer. Or, fill out the coupon for the Project Sheets you want and Reynolds will mail them to you.

BACK PORCH SHELF
Handy for the milkman and for you. Keeps deliveries dry in bad weather—holds packages while you unlock door. Easy to make.

MODERN CORNER TABLE
A modern corner table for your living room that combines the charm of wood and the elegance of aluminum. A project that's beautiful, functional—one you'll be proud to show. Request—PROJECT SHEET NO. 27

DECORATOR PLAQUE
A handsome stallion of aluminum and polished hardwood that you, and your friends, will admire for years. On—PROJECT SHEET NO. 30



LOOK FOR THIS RACK AT YOUR DEALER'S.
You'll find—Sheet • Tube • Bar • Rod Fasteners • Screen and Storm Sash Sections—it's Reynolds Do-It-Yourself Aluminum headquarters.

SLIDING DOOR TRACK SETS
Now, the toughest part of cabinet making is eliminated with new aluminum Sliding Door Track Sets. Use in all cabinet work where you plan sliding doors—plywood, masonite, glass—fit perfectly—glide easily—in ½" or ¼" double channels.

Watch Reynolds All-Family Television Program, "DISNEYLAND," ABC-TV.

REYNOLDS DO-IT-YOURSELF ALUMINUM
2493 South Third Street, Louisville 1, Kentucky

Send me Project Sheets for:
- ☐ Modern Corner Table (Project Sheet No. 27)
- ☐ Decorator Plaque (Project Sheet No. 30)

Name _____

Address _____

City _____ State _____

GIGANTIC SAVE-TO-70% **MAIL SALE** WAR SURPLUS EXCESS INVENTORY BANKRUPT STOCK

AIR COMPRESSOR BARGAINS
For painting, cleaning, tires, control termites. Assemble your own outfit. Lowest prices in U.S.
● **DeLuxe Kit.** Compressor, tank, gauge, regulator, paint gun, fittings. How to build instructions. List $52. SALE **$39.49** FOB.
● **Compressor** 1-cyl. **$19.95**; 2-cyl. **$49.95**; Govt. Air Tank. **$8.79**; Regulators. **$3.95**; Pop Off **$1.95**; Pres. Gauge **$1.89**. Finest paint gun **$11.95**. Auto switch **$4.75**. All prepaid.

WELDING GENERATOR
Finest ball bearing 300-amp 30-v air corps generator. Makes excellent welder, power plant, fast charge battery-charger, etc.
● Full instructions. Many applications. A real buy. Govt. cost $300. SALE.....**$23.95** FOB

HUNDREDS SURPLUS BARGAINS
● Amazing surplus buys, thousands of valuable items. Mechanical—electrical—sporting goods—electronics. Get our free illustrated catalog.

DIAL TELEPHONE
● Modern hi-efficiency attractive dial phone. Use for extension to main line on private system. Use several for complete private system, etc. Complete with ringer, dial, etc. Work on any system. Govt. cost $25.50. SALE.....**$9.95** Ppd.

STORAGE BATTERY WINCH
● Powerful fully reversible, ball-bearing gear reduction winch. 1000-2000 lb. pull. Use on 6 or 12-v battery. Holds 40' of 1/4" cable. For trucks, docks, boats. Govt. cost $280.....**$46.75** FOB

GOLF ELECTRIC CAR MOTOR
● Use golf or boys electric car. Geared 100 to 1. Run 6 or 12 volts. Easily reversible. Full instr. Wt. 34 lbs. Govt. cost $250 FOB **$19.46**

POWER PLANTS & GENERATORS
● Marvelous buys in new condition Govt. and factory surplus plants and generators. Write for catalog.
● 2500-w 115-v 60-c.. **$239.50**
● 3000-w 115-v 60-c.. **299.50**
● 5000-w 115-v 60-c.. **497.50**
● 3KW115-vDCGenerator **49.50**

SPECIAL OF THE MONTH!
HAND HYDRAULIC SYSTEM
● War surplus brand new expensive Blackhawk hand hydraulic twin piston pump. Pressure to 5000 lb. 294 cubic in. displacement.
● Wonderful for wagon unloaders, shop press, lift trucks, etc. Wt. 35 lbs. Govt. cost over $100.
SALE.....**$23.95** FOB

HYDRAULIC SPEED REDUCER
● Variable hydraulic speed reducer. Any speed from 0 to 750 rpm by simply throwing a lever. Handle up to 1½ h.p. Use for midget cars, shop band saws, etc. Instant reverse. Govt. cost $400.
SPECIAL.....**$47.81** FOB

SURPLUS WATER HOSE
● Marvelous buy, new 20-ft. lengths, 1½" diam. (inside) with threaded pipe nipples. Stand pressure to 75 lbs. Wt. 12 lbs. List $16.50.
SALE.....**$7.69** Ppd.

ORDER FROM AD or write for catalog.
BURDEN SALES COMPANY
824 West "O" St., Lincoln, Nebraska

PUT stock your Shop IN YOUR SHOP!

EASY TO GET AT!

With ONE HAND you can reach and get . . . *instantly* . . . exactly the size and type of screw you want. "STOCK your SHOP" is a smart, new, convenient, and economical way to buy and store screws. *Try* a few boxes. You'll *like* them!

SCREWS IN NEW CLEAR PLASTIC BOXES

EASY TO GET OUT!

59¢ PER BOX

LOOK FOR THIS SELF-SERVE DISPLAY AT YOUR STORE

FOR *EASY* DRIVING, ALL WOOD SCREWS ARE *SPEEDIZED*

An invisible lubricating film on "STOCK your SHOP" Wood Screws makes them *easy* to drive in even the hardest woods! This *free* extra feature eliminates bent and broken screws, prevents sore and aching hands. Ask for *"STOCK your SHOP" the next time you buy screws.*

ELCO TOOL & SCREW CORP., ROCKFORD, ILL.

NEW! FOR FINISHING WOOD EDGES

WELDWOOD FLEXIBLE WOOD TRIM
Real wood veneer, paper-backed, in handy rolls, for edging plywood, lumber. Many decorative uses. Apply with Contact Cement, or Presto-Set Glue. Oak, birch, African mahogany, walnut, fir, Sonora.® At your lumber dealer's.
SAVE! Get 89¢ sample roll, 8' x 1", specify wood. Send this ad with 50¢ to: United States Plywood Corp., Dept. PS-2-58 55 W. 44th St., N. Y. 36, N. Y.

"MINIATURE MACHINE SHOP
No Bigger Than A Typewriter, Outperforms Machines Many Times Its Size!"

That's what Mechanix Illustrated says about UNIMAT in their 3 page feature story in the May issue. If you want a reprint of this story plus complete information about this amazing 10 in 1 combination precision tool write to:

AMERICAN EDELSTAAL, INC., UNIMAT DIV. Dept. 128 350 B'way., N. Y. 13

"ARCO-SAW" does more than a $100 portable saw!

Build anything from a bookcase to a bungalow with this rugged portable saw. Fits any 3/8" drill. Rips & crosscuts up to 2" board. Exclusive "Dado-Arbor" adjusts for cutting grooves up to 1½" wide x 1" deep in ONE CUT! **Not even a $100 portable saw has a dado cutter.** Has Depth-Bevel-Rip Gages. Safety-yoke permits 1-hand operation. Incl. 5" blade..... **$12.95**

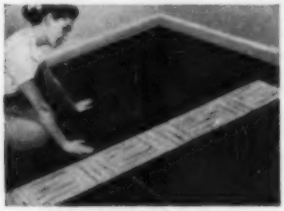
At Your Dealer or order direct on our **Unconditional 20-day Money Back Guarantee. Send check, M.O. (ppd.) C.O.D. plus post.**

ARROW METAL PRODUCTS CO.
Dept. PS-2 • 421 West 203 Street • New York 34, N.Y.

Yes! You can install a HAKO TILE FLOOR in a single afternoon

it's easy... it's fun... it's economical

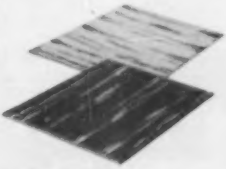
1. Measure and mark center points of two facing walls, disregarding bays, alcoves, etc. Snap a chalk line between these marks. Mark another line at right angles to this line through its exact center. Put an uncemented tile in one corner of the crossing chalk lines.



2. Work from center tile, laying a row of uncemented tile from wall to wall. If border is less than half a tile, take up one tile from opposite end of row and move the row away from wall half a tile. This will cover the other chalk line, so snap a new line, parallel to and one half a tile from the covered line.

3. Spread a 1½ ft. path of adhesive along one side of your two center chalk lines. Resnap chalk line wherever adhesive may cover it. (Use easy-to-apply Miltmark Roll-On Adhesive.) Let adhesive "set" (get tacky). Lay tile on adhesive along both chalk lines, wall to wall, but not in border areas.

You can enjoy a colorful Hako Tile Floor at amazing low cost by installing it yourself. You can't buy a smarter, more economical floor than Hako. It lasts for years . . . is easy to keep clean . . . and comes in a wide variety of colors and patterns in Asphalt and Vinyl-Plastic Tile. Save money—see your Hako dealer soon. He's listed under "Floors" in the classified telephone book.



Send for complete instruction booklet & tile selection chart

HAKO BUILDING PRODUCTS
Division of Mastic Tile Corporation of America
Dept. PS2, P.O. Box 128, Vails Gate, N. Y.
Houston, Tex. • Joliet, Ill. • Long Beach, Calif. • Newburgh, N. Y.

- Asphalt Tile
- Vinyl-Plastic Tile
- Coronet Plastic Wall Tile

HAKO

4. Cement two quarters of room (exclude border space). When adhesive "sets", lay tile, working away from center. Do not slide tile into position; place and press down. Cement third quarter before tiling second quarter and so on.

5. To mark border tile, place loose tile over last row of cemented tile. Place another tile on top of loose tile. Using top tile as a rule, mark tile underneath for cutting. Mark enough tile for one wall at a time. Then cut.

6. To cut tile, first heat back of tile over hot plate, gas burner, etc. Cut tile with sharp hook knife. (Hako Vinyl-Plastic Tile can be cut with household shears.) Spread adhesive in border area and place tile in position.

NEW! DREMEL MOTO-SHOP

Complete All-Family Power Work Shop

Dremel Moto-Shop is the first real multi-purpose workshop designed for the whole family. In one compact, portable unit you have a jig saw, disc sander, buffing wheel, bench grinder, and a flexible shaft machine. 5 power tools in 1 unit that do 1,001 jobs. For the kids it provides hours of constructive, creative recreation. It's invaluable to Dad, and even Mom, for hobby work and home maintenance. Moto-Shop is not a toy, but a professional-quality power tool with a ball bearing rotary motor. It's super-safe; cuts $\frac{3}{4}$" wood, metal, plastics, etc.; sets up anywhere, can be carried from room to room. Outperforms heavier, more expensive jig saws. See your power tool or hobby dealer today.

Model 571 (jig saw with disc sander attachment) **$33.95**

Model 572 (with all attachments shown) .. **$49.95**

FREE Moto-Shop Catalog. Write today!

DREMEL MFG. CO. Dept. 128B, Racine, Wis.

2 WAY PORTABLE RADIO SET

SENDS—RECEIVES UP TO 10 MILES AS SHOWN with built-in antenna or hundreds of miles with outside antenna! Works on 80 and 40 meter (Novice) amateur radio-bands-also Aircraft and overseas broadcast (3 to 8 mc). PORTABLE SELF-CONTAINED POWERED WITH STANDARD PORTABLE RADIO BATTERIES. NO AC PLUG-INS NEEDED! Take it with you everywhere you go—on trips, vacations, camping—Keep in contact with home, friends. Has 5 watt crystal controlled transmitter—Sensitive Regenerative Receiver. Send-Receive switch. Wt. only 3 lbs. Size, only 6"x7x4". TESTED—PROVEN—SIMPLIFIED—PRACTICAL—Full information given on quick easy way to get license.

SEND ONLY $3 (btll, ck, mo) and pay postman $11.95 COD postage on arrival or send $14.95 for postpaid delivery. Complete kit includes all parts, tube, coils plastoid cabinet, easy instructions. (Set of batteries $2.95; crystal $1.25.) COMPLETELY WIRED AND TESTED. POSTPAID $19.95. A regular $49.95 value—Order now before price goes up. GUARANTEED—AVAILABLE ONLY FROM:

WESTERN RADIO **DEPT. BNS-2** **KEARNEY, NEBR.**

ONE BIT FOR ALL

Handiest drill bit made. Use on any electric drill, lathe, drill press, etc. Made of finest American hi-speed steel, $3\frac{1}{2}$" long, $\frac{1}{4}$" diameter. Has $\frac{3}{8}$" side-cutting section. Cuts steel, wood, plastic, aluminum, etc. 3 types—specify types wanted. (1) All purpose, (2) Wood, (3) Heavy metal. *$2.45 each — 3 for $7.00 — Postpaid.* Money back guaranteed. Buy from your dealer or send check or Money Order and name of favorite tool dealer TODAY. (Makes ideal gift.)

.... DRILL SAW • REAM CUT

BEAVER HI-SPEED-SAW DRILL BITS

Jobber & Dealer Inquiries Invited

BEAVER DRILL & TOOL CO., 3008-A McGee Trafficway, Kansas City, Mo.

EVERYTHING FOR THE WOODWORKER AND HIS WORKSHOP

SHIPPED THE SAME DAY

THE CONSTANTINE WAY! *

World's oldest and largest supplier of rare and fancy imported and domestic fine woods, tools and hobby materials at lowest prices. This new book is full of bargains in cabinet woods, lumber, plywood, veneers, inlays, bandings, carved wood trim, mouldings, upholstery supplies, tools, unusual hard-to-get cabinet hardware wood finishing and how-to-do-it articles, plans, patterns, wood identification panel. Loaded with natural color. Newest, finest book offered. Send 50¢ today **(refunded on 1st order)** for this manual and get "Chips and Chats," a Constantine publication FREE for one year.

NEW SHIP SAME DAY SERVICE*

Don't hold up a project—no delay or wait for any item. New plant and facilities assure your order shipped the day received. **No extra cost the Constantine way. Send today!** ALBERT CONSTANTINE AND SON, INC., 2054H Eastchester Road, New York 61, N. Y.

MAIL COUPON TODAY!

Albert Constantine and Son, Inc.
2054H Eastchester Rd., New York 61, N. Y.

Enclosed 50¢ (refunded on 1st order). Send Catalog and **FREE** "Chips and Chats."

Name_____

Address_____

City_____ **State**_____

the right glue for every job you do

ELMER'S® GLUE-ALL!

and other Elmer Glues

if it's Borden's it's got to be good!

16 ways to make STEADY MONEY

with an International Cub® Lo-Boy®

If you're looking for a profitable spare-time business for yourself . . . then see how you can make steady money with an International Cub Lo-Boy! Jobs listed here are just a few of the many you can handle completely with the low-cost, 10 hp Cub Lo-Boy. You can get started for as little as $250, pay the balance monthly as you earn. Write International Harvester Co., Dept. PS2, P.O. Box 7333, Chicago 80, Ill., for information kit. Write today!

Mow	Dig holes
Plow	Saw wood
Disk	Spray trees
Drag	Pump water
Doze	Load
Excavate	Haul
Clear snow	Tow
Mix concrete	Sweep

INTERNATIONAL HARVESTER

WELD BRAZE SOLDER CUT

4 WAY WELDER

ONLY $14.75 f.o.b. factory

Complete with Twin Carbon Arc Torch and accessories . . . to handle all metal-craft work.

Acclaimed by thousands of Homeowners, Mechanics and Hobbyists as the welder of 1001 uses. Easily operated from properly wired 110 volt AC or DC line. **The ideal gift with a life-long use . . .** Order today on 10 day money back guarantee.

FOUR-WAY WELDER CO., Dept. F3-B
1810 S. Federal St. • Chicago 16, Ill.

ANOTHER OF INDUSTRY'S

MOST-WANTED MEN

General Electronics Technician—exceptional opportunities for men with basic training. I.C.S. method prepares you quickly and at low cost.

SEE SPECIAL OPPORTUNITY CHECK-LIST—PAGE 51

Works in seconds!

Loosens Rusted Bolts
nuts, screws, "frozen" parts!

LIQUID WRENCH®

The super-penetrating rust solvent that quickly loosens rust and corrosion.

AT HARDWARE STORES, GARAGES SERVICE STATIONS, EVERYWHERE

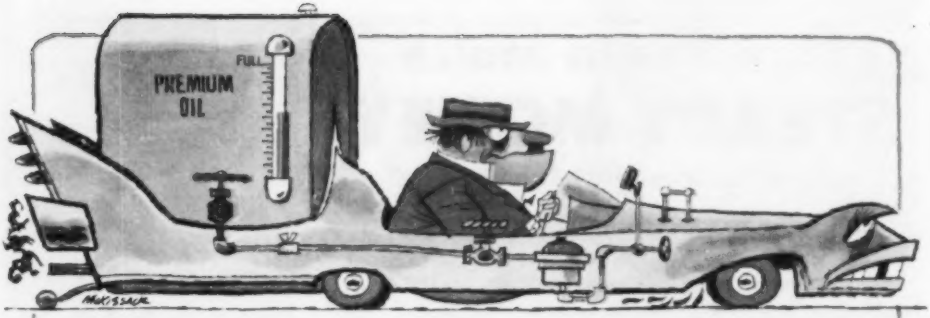
RADIATOR SPECIALTY CO.
Charlotte, N. C.

WARN HUBS ON YOUR 'Jeep'

STOP FRONT DRIVE WEAR

Over 100,000 Warn Hubs are now in use, *proof* that free-wheeling 2-w.d. with Warn Hubs means big savings in gear, engine, tire wear, gas, *plus* more pep, performance, power in high and easier steering. Now, with Warn Lock-O-matics, you have economical, drag-free 2-w.d. *or* tractive 4-w.d. *automatically, as you shift!* Ask your *local* 4-w.d. dealer to install Warn Lock-O-matic or Locking Hubs today. Fully guaranteed. Write for free literature.

WARN MFG. CO., Riverton Box 8064-B-2, Seattle 88, Wn.



Using too much oil?... call for HASTINGS

Excessive use of oil is your first sign of worn-out piston rings. And worn-out piston rings mean power drop-off—costly wastage of gas and oil—expensive repairs later on.

See your motor specialist the minute oil-pumping warns you there's trouble ahead. When he recommends new piston rings, ask for Hastings. They're engineered exclusively for replacement service . . . to stop oil-pumping, save gasoline, restore lost performance.

Get new car performance from your present car—with Hastings. Truly your best investment for thousands of extra miles of trouble-free driving. Hastings Manufacturing Co., Hastings, Mich. Piston Rings, Casite, Wear Reducer, Oil Filters, Spark Plugs

TOUGH ON OIL-PUMPING
GENTLE ON CYLINDER WALLS
U. S. PATENT NOS. 2614899, 2712971

HASTINGS PISTON RINGS

Wash off old paint with water!

Amazing how easy it is to use this miracle new WASH-AWAY Paint Remover. Just brush it on . . . wait a few minutes . . . wash off with water – your surface is clean, ready to refinish. Ideal for removing old finish from delicate antiques. Fine for outside use . . . siding, shutters, porches, boats. No scraping! Nonflammable!

AT SHERWIN-WILLIAMS DEALERS EVERYWHERE!

listed in yellow pages of phone directories

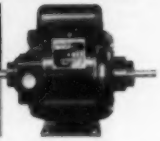
PREFERRED

by Leading Appliance Manufacturers

NOW AVAILABLE TO YOU!

EMERSON ELECTRIC

multi duti



MOTORS

First choice of manufacturers for 67 years! Now you can choose from 21 different designs from ¼ to 1 H.P. Write for free catalog No. M-162. The Emerson Electric Mfg. Co., St. Louis 21, Mo.

EMERSON-ELECTRIC

of St. Louis . . . Since 1890

ORDER DIRECT FROM AD

SEND PAYMENT OR PURCHASE ORDER TODAY

PHONE WEBSTER 9-3793

SURPLUS AND NEW MANUFACTURE

SELECTED

TOP VALUES

AT GROBAN'S

SHOP BY MAIL AND SAVE

SATISFACTION UNCONDITIONALLY GUARANTEED

FREE NEW '58 CATALOG

60 PAGES—Sensational Values Offering unsurpassed war surplus & new equipment bargains for farm, home, factory, workshop, etc. Write today

BRAND NEW

WALKER 5-TON HYDRAULIC LIFT KIT

ITEM #KW-116

FOR — • SNOW PLOWS • TO DUMP FARM WAGONS • ADJUST DEPTH OF PLOWS • HYDRAULIC PRESS • HYDRAULIC JACK. THE COMPLETE KIT CONSISTS OF: 1—Walker Hydraulic Hand Pump—Rated 1500 lbs. per sq. inch with 2 gal. hydraulic reservoir • Release valve • Filler plug and air vent • 28" steel handle. Fine for hydraulic presses; snow plows, jacks. Dimensions: 6" Diameter, 29" long with ⅜" pipe thread port. Pump Assembly Item #P449..... **23.50**

1—6 Ft. length double wire braid rubber covered hydraulic hose—tested to 20,000 lbs.| Item #27B4.. **3.95**

1—Hydraulic Cylinder, 3" bore, 6" stroke. Husky ¾" solid steel shaft. Will lift 10,000 lbs. using 1500 lbs. of pump pressure. Clevis mountings that take ¾" diameter pins. May be used for single or double action service. Overall length 17¼"—retracted. Item #C419..... **12.50**

1-Gallon hydraulic fluid furnished free with each kit. Plus all necessary hydraulic fittings. Total ship wt.—40 lbs.

COMPLETE KIT PRICE (ALL OF ABOVE INCLUDED).... **38.95** F.O.B. CHICAGO

1½ H.P. HYDRAULIC SPEED REDUCER with FINGERTIP CONTROL

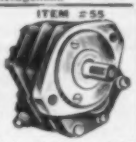
Item # 115

USE FOR: • Reamer Drives • Midget Cars • Feed Mills • Canning Machines • Conveyors • Lathes • Milling Machines • Motor Boats • Cream Separators • Garden Tractors • Pumps

Variable output speeds from 0 to input speed available by moving control handle. Locking handle maintains setting. Use input power of ¼ to 1½ H.P. Shafts ⅝" diam. Input rotation counter-clockwise facing shaft. Input speed 750 R.P.M. 7½"x7½"x11¼". Output rotation reversible. Shipg. wt. 31 lbs. Complete with 2 qts. of oil and full instructions. F.O.B. Chicago..... **72.50**

MULTI-PURPOSE

HYDRAULIC PUMP OR MOTOR



ITEM #55

Silent, high efficiency, Helical Gear Type Ball Bearing, Hydraulic Pump or Motor. Rated 8 Gal. Per Min. At 1500 R.P.M.—Delivers 1000 P.S.I. Using 6 H.P.—Reversible Rotation—¾" Pipe Thread Inlet and Outlet Ports—¼" Drain Port—¾" shaft with keyway and flat for either direct or pulley drive. Dimensions—5⅜" high, 7¼" long, 5⅛" wide. Shipping weight 18 lbs. F.O.B. Chicago..... **52.50**

ITEM #1008

PORTABLE

1000 WATT A. C. LIGHT PLANT

Electricity For Your Comfort

COMPACT—

Fits in the trunk of your car

FAST STARTING

ENGINE: CLINTON 3.6 H.P. Manual Start

GENERATOR: Ball bearing construction 1000 Watts, 115 Volts A.C. 60 cycles.

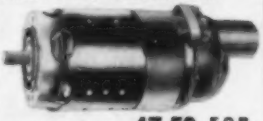
SAME AS HOUSEHOLD CURRENT

SIZE: 20½" x 12" x 16" Shipping Weight 100 lbs. boxed

PRICE: Save $110.00 from $259.50 list price. Now! F.O.B. Chicago....NET **149.50**

FOR WELDING, BATTERY CHARGING, ELECTRO-PLATING

GENERAL ELECTRIC D.C. GENERATOR



ITEM #G-476—400 amps., 30 volts D.C., using up to 20 H.P. 3700/7200 R. P. M. Rotation counter - clockwise. ¾" spline shaft. Dimensions: 18½" long x 7¼" deep. Shipping weight 75 lbs. **47.50** F.O.B. Chicago

SHAFT DRIVE-COUPLING from ¾" spline to ⅝" standard..... **3.95**

GROBAN FOUR-WAY OPEN CENTER

HYDRAULIC CONTROL VALVE

ITEM #126—Four-way open center control valve, with built-in adjustable relief valve factory set at 1000 P.S.I. Spring loaded neutral position. For use with one double acting cylinder. In neutral position cylinder is locked and pump unloaded. Can be used as single unit or mounted in series. Has ⅜" pipe thread inlet and outlet. ½" pipe thread cylinder ports. Finger grip handle. Ship. wt. 10½ lbs.

AN OUTSTANDING BUY!

F.O.B. Chicago..... **23.50**

37-PIECE METAL STAMPING SET

STAMPS NAMES, NUMBERS, ON WOOD OR METAL

ITEM #390-B — FULL ALPHABET, A-Z, NUMBERS 1-9, "&", AND PERIOD. PRECISION HAND TRIMMED, deep cut, hardened TOOL STEEL STAMPS — IN FITTED EASY ACCESS CARTON. Made to rigid U.S. Army specifications.

Only 5.50 per Set

2 FOR 10.00 Ppd.

GROBAN SUPPLY CO. DEPT. PS-2

GROBAN BUILDING

1139 S. WABASH AVE. CHICAGO 5, ILL.

WELD IT YOURSELF IN A JIFFY!

Weld, Cut, Braze, Solder; Iron, Steel, Brass, Bronze, Aluminum and other metals safely and easily. Make your wrought iron furniture, porch railings, fences, knick-knacks and other metal specialties. With this fine equipment anyone can do professional-like work with little practice. The Dynamic is an industrial type transformer arc welder designed to operate from any properly wired 110 volt AC line.

EASY PAY PLAN

Low down-payment. Pay as you weld. Money back guarantee. Complete outfit.

***Only* $38.50**

F.O.B. Factory

Order your Dynamic Industrial type transformer Arc Welder for Workshop or Industrial use today. Order from this ad.

Literature on larger equipment available on request.

DYNAMIC WELDER COMPANY, 1808 S. Federal Street, Dept. D3-B, Chicago 16, Illinois

Modernize with Marlite for years of wear, just minutes of care!

Give any room in your home a bright, new look with beautiful Marlite. This easy-to-install paneling in sheets, planks or blocks goes up fast over old walls or new with simple carpenter tools. And Marlite melamine plastic finish resists dirt, grease, stains, moisture. It cleans with a damp cloth; stays like new for years. See your building materials dealer for Marlite in distinctive "Companion Colors," marble patterns, wood finishes—or write for free decorating ideas book. Marlite Division of Masonite Corporation, Dept. 226 Dover, Ohio.

Guaranteed by Good Housekeeping

Marlite plastic-finished paneling

ANOTHER QUALITY PRODUCT OF MASONITE RESEARCH

GOT A LOCK PROBLEM?

To make locks work easier and last longer, add a few drops of LOCK-EASE to any lock mechanism. LOCK-EASE — a graphited fluid flushes out dirt — leaves a long-wearing protective film to seal out rain, snow, salt, ice and dust that cause locks to stick, rust and wear out. LOCK-EASE prevents keys from sticking... locks from freezing. Use LOCK-EASE on car locks, garage locks, padlocks and all door locks in and out of the home. For best results, "LOCK-EASE" locks regularly! 4-oz. "Drop or Stream" can only 49c, everywhere.

American Grease Stick Co.
Muskegon, Michigan

GENUINE ALNICO MAGNETS

AMAZING, PERMANENT, NON-ELECTRIC, HIGHLY PRACTICAL. Conduct interesting experiments. Hundreds of uses. Retrieve valuable steel items such as guns, tackle from fresh or salt water; tools from tanks & drains. GUARANTEED. Try any magnet one week. Money back if you are not well-pleased.

No. S-710	(Wt. 53 oz.) Has pull of 225 lbs. on steel block	$16.50
No. S-625	(Wt. 70 oz.) Has pull of 125 lbs. on steel block	$ 9.50
No. S-575	(Wt. 18 oz.) Has pull of 75 lbs. on steel block	$ 6.50
No. S-500	(Wt. 13 oz.) Has pull of 50 lbs. on steel block	$ 4.50
No. S-300	Kit of Flat Bars 5 Pairs (10 Magnets)	$ 3.00
No. S-250	Kit of Round Rods 5 Pairs (10 Magnets)	$ 2.50
No. S-47	Hot Pad Magnets. 10 for $1.00 ... 89 for	$ 4.87
No. S-38	Hobbyist assortment of 8 small magnets	$ 1.80

Send M.O. or check. We pay postage. Sorry no C.O.D.'s.

MIAMI MAGNET COMPANY, 3240 N. W. 27th Ave., Miami 42, Fla.

there's money to be made IN THE ORNAMENTAL CONCRETE BUSINESS

Manufacture—and sell—ornamental concrete products yourself. Easily, simply produced, here is a low-cost, do-it-yourself project that means money—Big Money.

CMC permanent, light-weight, high quality Aluminum Molds give you both ease of production and copyrighted designs that have set a national record of sales success.

Get the full story of this high profit, low cost business. Send today for your copy of the big, fully illustrated book "How to Turn Concrete into Gold." The clear, easily followed "from start-to-finish instructions" that show you how to produce beautiful, ornamental concrete products. Plus valuable sales and market tips. Catalog of over 200 Specialty Molds. A complete industry manual.

Send $2.00 for your copy—

CMC CONCRETE MACHINERY COMPANY, INC.
DEPT. PS HICKORY, NORTH CAROLINA

250 POWER.....

Complete Telescope Lens Kit only **$3.49** postpaid

Conquer Space, Explore the Universe, Planets, Moon craters, New Stars, etc. Complete Lens Kit consists of 60 inch focal length ground and polished objective lens, eyepiece lenses for 50 POWER, 100 POWER, 150 POWER, 200 POWER, 250 POWER, and all necessary lens fittings. Easy to make from simple step by step instructions. (Tripod and mount not included.) Money back guarantee.

BUSSE SALES CO., Hartford, Conn., Dept. PS-64

A FEW OF THE REALLY RARE GERMAN SUBMACHINE GUNS $19.95

The famous super rapid fire "burp" guns. If you were with Bradley or Patton in Normandy, you remember the coughing bark of those guns that were so tough to root out of the hedgerows. All complete and in fair to good condition. A real "conversation piece" and souvenir for your trophy wall, den or fireplace. These are the extra fine precision automatic submachine guns of early WW II. Barrels are plugged to conform with federal law on war trophies. Triggers snap, actions function perfectly and can be disassembled. YOUR CHOICE of German Bergmann, German Schmeisser, German Erma, German Steyr Solothurn, Italian Beretta and a few British Lanchesters. All $19.95 each FOB Los Angeles. (Any two for $37.50.) Send check, cash or money order. Send $10 per gun for COD. 10-day money-back guarantee.

THE ELLNER COMPANY
Dept. 75, 1206 Maple Avenue, Los Angeles 15, Calif.

KENNEDY all purpose tool kit . . .

LOW COST RUGGED PROTECTION FOR YOUR TOOLS...!

Model CS-19
19"x7"x7"

- A Kennedy quality value at low cost.
- Rugged steel construction that can really "take it".
- All you need for home or shop.
- Dark brown ripple baked enamel finish with contrasting dark green trays.

Kennedy Small Parts Cabinet — A place for every small part in this handy, durable steel cabinet finished in brown, ripple baked enamel. Four drawers with different size compartments.

Model S D
13⅛" x 10⅛" x 11"

Mail Coupon Today

Kennedy Manufacturing Company
Van Wert Ohio, Dept PS-2

Please send name of nearest Kennedy Dealer.

Name _____

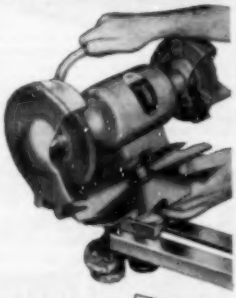
Address _____

City and State _____

Kennedy Kits

KENNEDY MANUFACTURING COMPANY, VAN WERT, OHIO

$ 1,000 A YEAR SPARE TIME INCOME



Spend only 1 or 2 hours a day sharpening saws, maintenance tools, knives, etc. Versatile, low-cost Foley 314 Grinder (only $133.75) puts you in this high profit business. You can make $3 to $5 an hour —sharpen just 3 saws a day, for instance, and you can put over $1,000 a year in your pocket. You clear 95¢ out of every $1.00 you take in! Thousands of farmers, home owners, schools, industries, contractors need this service.

FREE PLAN shows how to get started, get customers, expand your business. Send coupon for information now! No obligation. No salesman will call.

FREE PLAN shows how to get things you want by using your spare time.

FOLEY MFG. CO. 276-8 Foley Bldg. Minneapolis 18, Minn.

Send FREE PLAN for spare time home business with Foley 314 Grinder.

Name .....

Address .....

.....

3398

WHAT...

...DO YOU KNOW ABOUT HAND SAWS?

QUALITY STEEL...

Good saw steel should be hard enough to hold its cutting edge and yet malleable enough to be flexible. Only saw manufacturers who operate their own mines and steel mills can give you the uniform controlled steel consistency necessary in every saw blade. Sandvik Swedish Charcoal Steel Hand Saws feature this high quality hand saw steel. This is only one of Sandvik's many exclusive advantages. Before you buy **any** hand saw, ask your dealer to show you a Sandvik.

Write today for the new 16 page booklet... "Things You Should Know About Hand Saws". It's free - Dept. PS.

Sandvik STEEL, INC.

Saw & Tool Division
1702 NEVINS ROAD, FAIR LAWN, N. J.

In Canada: P.O. Draw 1330, Station "O", Montreal 9

CUT-TO-FIT HOMES CUT BUILDING COSTS

CHOICE OF 57 DESIGNS

ORDER NOW

SAVE UP TO 1/3

Build your own home and save the builders' profit—plus savings in lumber and labor with Sterling Ready-Cut-Homes. Anyone can assemble with simple, easy to follow plans furnished. Every house complete with all lumber, roofing, nails, glass, hardware, paint, doors and windows marked ready to erect. Freight paid. Complete building plans ready for filing at low cost. Sold separately if desired. Write today!

PRICED FROM $2150 up

Five Easy Payment Plans

Send 25c for NEW COLOR CATALOG

INTERNATIONAL MILL AND TIMBER CO.
DEPT. PS 28 BAY CITY, MICHIGAN

KEEP DRIVING STRAIGHT IN '58

HULL AUTO COMPASS

America's favorite motoring guide for 25 years. At your dealer's or write for literature.

Ever-Dependable Boating Guides, Too

$6.95 and $5.50

HULL MFG. CO., P. O. Box 246-E2, Warren, O.

NEW MAGIC RADIO WALKIE TALKIE!

YOUR OWN POCKET SIZE RADIO STATION!

BROADCASTS TO ANY HOME OR CAR RADIO WITHOUT WIRES OR HOOKUPS! Wt. only 5 oz. Size (1½x2½x4½". Built-in telescoping antenna. Powerful Transistor-sensitive microphone, frequency setter, break-in switch! Runs for weeks on self-contained flashlight batteries. Durable plastic case. With this Radio Talkie you CAN TALK TO YOUR FRIENDS UP TO A BLOCK OR MORE AWAY! Talk up to 1 mile or more between two automobiles. INSTANT OPERATION! Just push button to talk! No license needed. Uses inductive field magnetic radiation. Useful and real fun in a million ways! GUARANTEED TO WORK. 1 YEAR SERVICE GUARANTEE.

SEND ONLY $3.00. (cash, ck, mo) and pay postman $9.99 COD postage or send $12.99 for prepaid delivery. COMPLETE READY TO OPERATE with instructions and hundreds of ways and tricks for broadcasts thru any radio you desire. Price may go up soon, so get your NEW POWERFUL RADIO-WALKIE TALKIE NOW. Available only from: WESTERN RADIO, Dept. RPS-2, KEARNEY, NEBR.

AMERICA'S FINEST RIDING MOWER

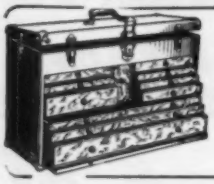
Enjoy the easy-going comfort of today's most exciting riding mower. You cut grass evenly, effortlessly, so safely a child can do it. You get real automotive steering too, plus Versa-matic Drive that lets you change speeds without stopping or clutching. With six Ridemaster attachments, you put riding comfort into outdoor jobs year-'round.

BOLENS

ridemaster

BOLENS PRODUCTS DIVISION
Food Machinery & Chemical Corp.
Port Washington 6A, Wisconsin

SEND FOR CATALOG



SATISFACTION

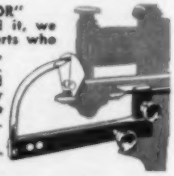
Know the satisfaction that comes from using a fine product, built to last. Free Catalog to Machinists and Tool makers.

Gerstner Tool Chests
558 Columbia St.
Dayton 7, Ohio

"SAW GULLET ANGLE INDICATOR"

After years of necessity, we invented it, we now make it, we sell it to saw experts who take pride in high class workmanship, economy of time, and file expense. You set file to precise, predetermined position in only seconds. Designed for Automatic Power saw Filers. Complete with drill & tap. $15.00 in U. S.

HOOKER-HALL
410 E. Colo. Ave., Colo. Spgs., Colo.



132 PAGES
Many in full color
packed with rare, fancy & imported woods ... veneers, plywoods, patterns, tools, ornaments, hardware ... everything for the woodworker.

Get This NEW Catalog of WOOD & WOODWORKING EQUIPMENT

WORLD'S LARGEST SELECTION OF FINEST DOMESTIC AND IMPORTED WOODS . . . MOULDINGS, HARDWARE, TOOLS,—ALL AT LOW MONEY SAVING PRICES!

Your complete wood buying guide and project book. Craftsman is your best, most complete source of finest kiln-dried domestic and rare imported woods, beautiful wood inlays, colorful bandings, matched plywoods, embossed mouldings, carved ornaments, newest woodworking tools, "hard to find" cabinet hardware and fittings. . .more than 1,500 items! Packed with newest scroll saw patterns, project ideas & money making plans. Enclose 25c (refunded with first order) to help pay mailing, handling cost. Write now!

Craftsman Wood Service Co., Dept. B-2
2729 S. Mary Street • Chicago 8, Ill.

WAR SURPLUS AND OTHER BARGAINS SAVE UP TO 90%

FAMOUS NAVY MK14 AIR COMPRESSOR Great for paint, tree and termite spraying, air brushing, filling tires, etc. Dual and remote control elec. receptacles, 115V 60 cycle AC 1/3 H.P. Westinghouse Motor. Direct drive. Draws 10" of vacuum. Water- and Explosion-proof. Built-in air filter, adjustable pressure setting up to 47 lbs. Built-in pressure gauge. Self-contained switch. Mounting brackets. Wt. 66 lbs. gross. Approx. GOVT. COST $585. Like NEW. Only **$19.95.** With steel hand cart (rubber wheels) specially constructed for mounting this unit. 15' rubber air hose, 6' extension cord with plug & fittings. Wt. 76 lbs. Complete **$26.50.**

BUILD YOUR OWN ARC WELDER, LIGHT PLANT OR BATTERY CHARGER $37.50 Kit incl. 1 Navy NEA-5 Gen. combination AC-DC type. AC 115 V. DC 24 V., 200-300 Amps. 2 complete generators in 1, yet no larger than reg. gen. Ideal for home, shop and farm lighting plants. Delivers 1200 Watts AC, DC side for charging batteries, welding and operating war surplus motors. Also in kit: 2 Voltage Regs., AC & DC. Reverse Current Relay, 30' new welding cable, Rheostat, Electrode Holder, Toggle Switch, Welder's Shield, Wiring Diagram for kit. Wt. under 100 lbs. Approx. GOVT. COST $650. Kit—**$37.50.** Navy NEA-5 Gen. as above, purchased separately, **$23.50.**

ARC WELDER KIT—$26.00 Build your own complete make-up package incl. 1 Aircraft DC Gen. 200 Amps. 24 V; Rheostat, Toggle Switch, 30' new welding cable, Electrode Holder, Welder's Shield, Voltage Reg. Simple instruction wiring diagram. Wt. under 100 lbs. Approx. GOVT. COST $475. Like new, perfect. All units guaranteed pre-tested. **$26.**

R1 GENERATOR KIT Jack & Heintz or GE. Rated 300 Amps. 24-32 V. With same items as above. Approx. GOVT. COST $600. Complete 60 lb. kit — **$38.**

6' BEAM COMPASS Fits in your vest pocket. Draws ellipses, spirals, arches and circles up to 12'. Contains stretch-proof linen line on aluminum encased reel. NEW. Complete with 3 special push-pins—**$3.00** ppd.

G.E.D. FLAT BEVEL SCALES 8 scales on 1 side. Standard size scale 13½" long x 1⅝" with 100' reading on 1/8" and 50' on 1/4" scale (need not be turned over to find desired scale) graduated in 1/8, 1/4, 3/8, 3/4, 1/2, 1, 1½ and 3 inches to the foot. **$2.75** ppd. Pocket size scale is 7½" long x 1⅝" with 52' reading on 1/8" and 26' on 1/4" scale. All edges parallel. Can be used as a straight edge. In leather sheath—NEW—**$2.00** ppd.

EXPLOSIVE RIVET & BLOW TORCH KIT Contains 300 assorted Dupont Explosive Rivets, 1 set of 9 fractional drills, 1 Butane Blow Torch with extra cartridge—everything needed for blind riveting. Torch can also be used for precision soldering, brazing, etc. 3500° pinpoint flame. Approx. GOVT. COST on rivets alone, $90. Complete kit **$5.95** ppd.

DUPONT EXPLOSIVE RIVETS Essential wherever blind riveting required. 1/8", 5/32", 3/16". Round & flat heads. Approx. GOVT. COST 32c ea. 1,000 assorted for only **$5.00** ppd.

PROPELLER BAROMETER A precision weather instrument mounted in center of genuine rock maple radio drone "prop". Perfect for den, trophy room, boy's room. Smooth, highly varnished propeller, 30" tip to tip, cost govt. approx. $57 ... now, with barometer inserted, only **$9.95** ppd. Propeller separately (can be used to operate ice sleds, etc.). NEW. **$4.95** ppd.

BENDIX GEROTOR PUMP & MOTOR Use wherever fluid pumping required. Excellent for hydraulic installations. Has ¾" pipe connections, built-in relief valve adjustable up to 1500 lbs. Max. cap. 6 GPM. 1/8 H.P., 24 V. motor. Use on 12 to 36 V. Approx. GOVT. COST $350. NEW. **$10.95.**

B-16 KOLLSMAN AIRCRAFT COMPASS Ideal for boats, cars, etc. Grad. in 5° increments. Liquid-filled. Lighted. Poly-plane compensator. Panel mounting. 3⅛" dia. face; 4½" deep. Checked & tested in our own lab. Approx. GOVT. COST $150. Like NEW. **$12.95** ppd.

ASTRO COMPASS MARK II Used by USAF & commercial airlines. Makes pelorus & azimuth circle for air or marine navigators. Great for astronomers. Incl. carrying case. Tested for accuracy in our own lab. Approx. GOVT. COST $400. Now **$10.95.**

140-1 REDUCTION GEAR For beaching boats, winches, hoists. Ideal for motor in golf or boys electric car. Built-in (removable) DC motor & clutch. Hi torque, lo speed. Runs on 6-12 or 24 V. Wt. 65 lbs. gross. Approx. GOVT. COST $300. Like NEW. **$12.00.**
*225-1 REDUCTION GEAR, as above — **$13.50.**

ELECTRIC PUMP WITH CONTROL UNIT Runs on 12 or 24 V. Centrifugal type. Pumps 500 GPH. Complete with on and off switch rheostat, 2 speeds (hi & lo). Mfd. by Ingersoll-Rand. Shpg. Wt. 7 lbs. Approx. GOVT. COST $195. NEW. **$8.95.**

HEAVY-DUTY RHEOSTAT Ideal for regulating voltage on electric welders. Rated 5.75 Ohms, 100 Watts with double windings & dual female 25 amp., 125 V. receptacles. 7" hi x 5¼" D. Shpg. wt. 2½ lbs. Approx. GOVT. COST $25. Brand New. **$2.25** ppd.

ADJUSTABLE QUADRANGLE Replaces many triangles. Full quadrant 0° to 90°, calibrated to every 30 min. of arc, thus a reading or setting to 15 min. is easily obtained. Set arm to any degree of triangle. Roof Pitch Scale, Percentage Slope Scale, Sine Scale. Every edge a drawing edge. NEW. **$7.50** ppd.

CHRONOMETRIC TACHOMETER Built to U.S. Navy & Air Force specs. Standard brand. For counting revolutions per min. for any rotating shaft. Can be used on speeds up to 3000 RPM. Accuracy to 1/10 of 1%. Complete with male & female tips & shock-proof case. GOVT. COST $87.50. NEW. Only **$19.95** ppd.

HOMELITE PORTABLE POWER PLANT Ideal for welding, battery charging, emergency lights for cabins, camps, aircraft, trailers or wherever power needed. Easy rope pull starting. Fully equipped, ready to start. 2000 W., 32 V., 3 H.P. Like NEW. Tested. Shock-mounted. DeLuxe type. Net wt. 115 lbs. Gross wt. cased 200 lbs. Approx. GOVT. COST $700. Now — **$68.00.** 2500 W. — **$75.**

MICROMETERS Black crackle finish frame. Easy-to-read graduations in .001. NEW. 0-1" cap. **$2.60** ppd. 1-2" cap. **$3.75** ppd.

NEW! TERRIFIC! 1958 CATALOG! Thousands of bargains in war surplus & other items. Hundreds of pictures. Send 25c for your copy today! Ppd. prices in USA only. Other prices FOB Culver City, Calif. Send cash, check or money order. 50% deposit on COD.

AIRBORNE SALES CO., INC. DEPT. PS258
8501 Stellar Drive, Culver City, Calif.

SMALL! POWERFUL!

ECONOMY TRACTOR

Unequalled value! Low price!

America's finest tractor. Ruggedly built. Easy to operate. 790 lbs. Borg-Warner clutch, trans. and diff 140 to 1 reduction. 40% more drawbar pull than ordinary tractors 8-1/4 H. P. engine. 20 quick change implements. HOOD, FENDERS.

Thousands in Use

Write for complete details.

Engineering Products Co.
915-A-2 Niagara Ct.
Waukesha, Wisconsin

10" TILT/ARBOR SAW
BUILD-IT-YOURSELF
from GIL-BILT KITS-PLANS

Sturdy wood, steel, and aluminum construction, NEW DEPARTURE ball bearings. Capacity and performance of floor saws selling for $150.00 and up. Plans, all metal parts in kit with 10" comb. blade **$25.00**, less blade **$22.95**, F.O.B. St. Louis. Detail PLANS-PATTERNS only $1.00 postpaid.

Build-it-yourself 12" and 18" Bandsaws, 6" Belt Sander, Shaper. Simplified plans, build easily with hand tools only. Advertised and sold for 11 years, over 33,000 units in use. Money back guarantee. FREE CATALOG.

GILLIOM POWER TOOLS, Dept. 70-B, Lambert Field, St. Louis 21, Mo.

SAVE MONEY on LUMBER
with the LOW-COST
BELSAW PLANER

• Convert Rough and Random Size Lumber Into Cabinet Finished Stock

Now anyone can make perfect cabinet finished stock from low-cost rough lumber... any size up to 12½ inches wide and 6 inches thick. Turn out high grade finished material at a fraction of the cost you pay lumber yards. Big 42-inch-long bed makes it easy to plane heavy, wide and long pieces... BELSAW self-feeds at 14 to 34 feet per minute.

USE THIS ONE LOW-COST MACHINE for Planing, Jointing, Sawing, Milling, Tongue and Groove.

You can easily make flooring, siding and many other popular patterns with your Belsaw. Your Belsaw quickly pays for itself with savings on raw materials and profits on finished stock ... a highly profitable machine for custom work. Compare Belsaw with any 12-inch planer on the market... Belsaw gives you more essential features—yet costs you $50 to $125 less than others.

Send Today for Free Literature on the Belsaw Multi-Duty Planer.

BELSAW MACHINERY CO 2068 Field Bldg. Kansas City 11, Mo.

New! WOOD BLEACH

a Dexall short cut to natural wood beauty!

- Easy way to modernize old-style wood finishes
- Just apply . . . sponge off . . . color's gone!
- Will not harm finest woods

At Paint and Hardware Stores Everywhere

DESHLER PRODUCTS INC. • Deshler, Ohio

BUY at dealer's prices direct from MASTER MECHANIC factory!

MASTER AIR COMPRESSOR

COMPARE! This is the only compressor built with a NO RUST stainless steel tank. Safe up to 500 lbs. (Item 209) High pressure type (4 c.f.m.) Large volume of air for heavy duty spraying, inflating truck & auto tires, greasing, sand blasting, etc. Piston type 2" bore compressor with built-in air filter. Master built with high strength alloys and precision bearings. Tank, 12"x24", 2100 cu. in. cap. Equipped with automatic switch that starts and stops motor to maintain desired pressure (up to 150 lbs.) and check valve, safety valve, gauge, shut-off valve, 50 ft. air hose and tire chuck. Beautifully balanced on ball bearing wheels and rubber tires. Don't take chances with used or surplus equipment. Our compressors are factory new and are guaranteed **SAFE.** Low factory prices. ½ HP. Model (Cap. 85 lbs.) Regularly $175. (Item 209) **$109.50**
½ HP. heavy duty model. Rep.-Ind. motor & unloader switch (Item 209a) **$129.50**

HEAVY DUTY D-C ARC WELDER

Use as portable or shop welder. Up to 300 amps. Senior model. Made for years of trouble-free, continuous service. Will handle light or heavy jobs. Easily welds up to ¾" plate using ¼" rods. Built-in air cooling system. Arc is easy to strike and hold, because of specially designed arc stabilizer. Hi-lo switch and dial control gives wide range of welding heats. Run welder at 2600 rmp. with tractor, jeep or 15 hp. gas engine, or 7 hp. and triple V belt or flat pulley. You can pay more, but you can't buy a better welder. Wt. 110 lbs. $400.00 value **$119.50**
WELDING KIT Two 10 ft. leads, welding helmet, electrode holder, ground clamp. Sold only with welder at **$10.50**

MASTER MECHANIC MFG. CO., Dept. B-28, Burlington, Wis.

PAGE FOR TILLING PLOWING MOWING

FULL LINE 2 to 6 HP with complete gear drive and reverse.

Free Catalog LOW PRICES EASY TERMS Over 30 Years Experience

FULLY GUARANTEED! Over 60 attachments available!

PAGE 1916-A S. 81st Street MILWAUKEE, WIS.

KASENIT COMPOUND FOR CASE HARDENING OF TOOLS GUN PARTS, MACHINERY, ETC.

Easy to Use—Needs No Special Equipment—NON-Poisonous — NON-Explosive — NON-Inflammable. SPECIAL OFFER 1 LB. CAN $2.50 Postpaid with Complete Instructions.

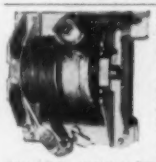
MONEY BACK GUARANTEED—(FOLDER FREE)

KASENIT CO. (EST. 1912), 7-8 KING ST. MAHWAH, N. J.

SEPTIC TANK TROUBLE?

NORTHEL Reactivator keeps septic tank and cesspool clean. Bacterial concentrate breaks up solids and grease—prevents overflow, back-up, odors. Regular use saves costly pumping or digging. Simply mix dry powder in water, flush down toilet. Non-poisonous, non-caustic. Guaranteed to reactivate septic tank, cesspool. Six months supply (23 ozs.) only $2.95 postpaid.

NORTHEL DISTRIBUTORS, PS-2
P. O. Box 1103 Minneapolis 1, Minnesota



Used perfect HOIST and WINCH

Eliminates Backbreaking Ordeals . . . Small but Mighty. Made to be used on B-29's for lifting bombs. 2,000 lb. capacity. Wgt. 16 lbs. Perfect for lifting or moving loads in trailers or auto trucks, tractors, on any other movable machinery. Fine for garages, implement stores, warehouses, assembly lines, contractors and many other uses. Original cost, Appr. $200. Our price FOB KC . . . **$24.50.** Satisfaction guaranteed . . . Mounting Bracket . . . $4.50 extra
SPECIAL: Portable 4" SPOT LITE (Navy)—Sealed beam; pistol grip. 4500 candle power. Fits 12 V. systems for cars, boats, etc. only $4.00
TURBO TURBINE BLOWER: Complete with Explosion Proof Motor. Blower 3½" Inlet, 4" Outlet, Motor, Marathon ½ H.P., 3450 R.P.M., 220 V., 3 Phase. Ideal for Furnaces, Forges, Cooling Carts, etc. slightly used but guaranteed for peak performance. Complete unit, only **$59.95 FOB K. C. Mo.**

Write for catalog—hundreds of items

NATIONAL SURPLUS SALES CO.
1812 Charlotte Kansas City, Mo.

NEW AND EASIER FOR EVERYONE TO USE

FOR THE MAN WHO WANTS THE BEST

TURNER Propane Gas TORCH

FOR:
Soldering
Removing Paint
Laying Tile
Sweating Copper Tubing
Thawing Pipes
Removing Putty

The instant lighting torch that burns in any position. No pumping—no priming—for refueling just unscrew the disposable tank, discard, and replace with a new full tank available everywhere. Complete with fuel.

Other TURNER Propane GAS APPLIANCES include
ONE and TWO BURNER CAMP STOVES and CAMP LIGHT

FREE Folder on TURNER PROPANE GAS APPLIANCES. WRITE TODAY!

TURNER BRASS WORKS
SYCAMORE, ILLINOIS

New "PULL-GEAR" SPEED-REDUCING PULLEY

Provides Correct Speed and Power to Drill Up to 1 3/8" with 1/2 H.P. Motor

Amazing new internally geared speed reducer doubles drill press capacity. Greater power, greater efficiency, greater productivity. Provides the correct speed and power for larger drilling, reaming, tapping and boring on light presses. Easily installed in five minutes. Adaptable to all type machines. Spindle speed range approx. 45 to 3000 RPM. Made in 3 motor shaft sizes: 1/4"—3/8"—3/4". Write for literature.

WRITE FOR LITERATURE

THE PULL-GEAR CO.
25429 Mound Road
Center Line, Michigan

DEALERS: Chicago, Ill.—Chicago Supply & Tool Co.
Cleveland, Ohio—Reynolds Machinery Co.
Los Angeles, Calif.—Almquist Brothers
New York City—Rudolf Bass

NEW! ILLUSTRATED POWER & SPEED CATALOG!

OVER 500 PICTURES - TUNING TIPS - COMPLETE DATA ON ALL LATEST CARS!
WRITE TODAY! 75¢

ANSEN AUTOMOTIVE
6317 S. Normandie
Los Angeles 44, Calif. Dept. PS-2

with McKINNEY Forged Iron Cabinet Hardware

For den, kitchen, family room or living room. Easy to install. Dull Black, Swedish Iron or Olde Copper finishes. At your local Hardware or Building Supply dealer.

McKinney Mfg. Co., 1715 Liverpool St., Pittsburgh 33, Pa.
Please send illustrated Forged Iron Cabinet Hardware Literature
Name_____
Address_____
City_____ Zone____ State_____

FOR GLASS-SMOOTH PAINTING!

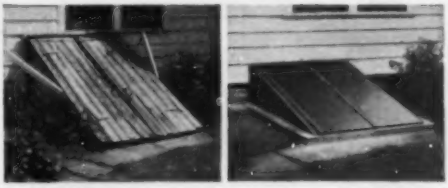
Dexall TRADEMARK
Tack-Rag
For Finest Enameling and Varnishing

Simply wipe the Dexall Tack-Rag over sanded surface before enameling or varnishing. It picks up every trace of dirt, dust and sanding particles... assures a professional-looking job!

At Paint and Hardware Stores Everywhere

DESHLER PRODUCTS INC. • Deshler, Ohio

TROUBLESOME WOOD HATCHWAY?



REPLACE IT!

With a modern Bilco Basement Door. All-steel, weathertight, spring-operated. Do it yourself in just 3 to 4 hours.

Bilco
AMERICA'S FINEST BASEMENT DOOR

Write today for FREE *illustrated replacement folder.*

THE BILCO CO., Dept. 117
NEW HAVEN 5, CONN.

Please send me complete information.
NAME .....
ADDRESS .....
CITY ..... STATE .....

PALLEY'S SPRING SALE

WAS 4.95 — 2.95 WITH CASE

12 Pc. SPORT KNIFE

4-5/8" BONE HANDLE

Eliminates 12 items from pack or tool box! Ideal for every outdoor sportsman, hunter, camper, rancher, Boy Scout, fisherman, etc. Has 11 quality steel tools. 1. A regular knife, 2. fork, 3. spoon; 4. draw-knife, 5. bone saw & fish scaler; 6. scissors, 7. can & bottle opener; 8. cork-screw; 9. awl punch; 10. screwdriver, 11. fingernail file. All this plus leather belt holster.

FINEST STEEL BAYONET

A genuine Infantryman's bayonet. Made of finest tool steel. Has fluted sides and precision honed edge. 17" blade is ideal for many uses. Comes complete with reinforced leather scabbard. ONLY 2.98

NEW NAVY FIGHT KNIFE

A dagger design. Has laminated leather handle. Blade is 6-1/2" long, hollow ground on the cutting edge – double edged for 3½" at the point. Ideal for a skinning or hunting knife. With leather holster. Over all lgth. 11". 3.98

27" ARMY MACHETE & CASE

Ideal for clearing brush. Made of finest Vanadium Steel. Has 22" blade. Wood handle. Overall lgth. 27". Complete with rugged belt sheath. Save 85%..... ONLY 1.98

ARMY PORTABLE SHOVEL

Genuine G.I. SURPLUS. Has 20" hardwood handle. Blade folds to form pick or shovel. Ideal for Scouts or emergency. 1.98

NEW ARMY PICMATTOCK

1.98 Ideal for use around the garden or camp. New Army Surplus. Small, easy to use. Has a 12" steel head with a Mattock on one side and a Pick on the other. 16-1/2" handle. With case.

100% NYLON COVERALLS

Just released by the Air Corps. Excellent condition – 100% NYLON in Air Corps blue. Has 8 pockets with zipper closures. Adjustable waist. Sleeve pencil pocket. Also full zipper front & ankles. Sizes to fit 30 thru 42. 4.88 15.00 VALUE

5 POWER ILLUMINATED MAGNIFIER

NEW IMPORT

Gives brilliant illumination for precise inspection of any material, substance or specimen. The head contains a large 30mm lens and has an internally calibrated scale to show relative size of subject. All-metal body holds 2 flashlight batteries. A 7.95 value... NOW ONLY 3.49

SPECIAL 60 to 450 Power MICROSCOPE

HAS 60, 120, 150, 180, 300 and 450 POWER MAGNIFICATION

With NEWLY DEVELOPED SUB-STAGE LIGHT which ELIMINATES NEED for ANY EXTERNAL LIGHT SOURCE.

Another Palley Optical Bargain. Ideal for scientific inclined Boys & Girls, Adults, Home labs, etc. Has precision ground and polished lenses. Two interchangeable eyepieces of 6X and 15X – Triple revolving turret with 10X, 20X and 30X lenses – Patented sub-stage mirror with self-contained light for use without external light source plus large sub-stage mirror for use with external light source when desired – All metal body which inclines through 90° – Fitted wood case and 3 glass slides. Order WHILE STOCKS are COMPLETE!

FREE with MICROSCOPE 8-PIECE DISSECT SET. Has Scalpel, Scissors, 6 Slides, Tweezers, Magnifying Glass, etc..... NOW 10.95

STAINLESS STEEL AIR TANKS

G-1 Type Army Surplus. Shatterproof and Rustless. Built to withstand up to 400 PSI with a high safety factor. Has 1/4" pipe ports. Ideal for use in Air Storage for Painting, Spraying, etc. Can also be used for water storage, as a Buoy, etc. Size: 13-1/2" diameter x 24" length. A SURPLUS BARGAIN!

UNUSED 16.95 USED 12.95

SPECIAL GOV'T SURPLUS HYDRAULICS

3000 PSI HYDRAULIC CYLINDER

This is the finest, genuine Gov't Surplus stock. Bore is 2¼", shaft is 1", stroke is 4" and the eye-to-eye length is 13½". All ports are ¼" AN. These have been used but are in excellent condition. 12.50

396 Pc. FREE CATALOG

NEW & USED GOV'T SURPLUS, FACTORY CLOSEOUTS and SPECIAL IMPORTS! Thousands of Items to choose from. Order your copy TODAY! Send 50¢ for handling & mailing. 50¢ refunded with your 1st order.

DBL. ACTION HYD. CYLINDER

Bore is 2", shaft 7/8", stroke 9", length 14-1/4". New in excellent condition... 7.95

PESCO HYD. PUMP

Displaces 2.5GPM at 1000 PSI discharge pressure. Rated at 1000 PSI continuous. Special at only 9.75

Palley's

TO ORDER: Send check, or M.O. ½ deposit with C.O.D.s. Prices F.O.B., Los Angeles, Calif.

2263 E. VERNON AVE., DEPT. PS-2, LOS ANGELES 58, CALIF

TWO GREATEST RIFLE BARGAINS EVER OFFERED!

GUNSMITH TO YOU $19.95

POWERIZED, ACCURIZED

7.5mm (.30 cal.) BIG GAME SPORTER

Starting with a beautiful surplus Swiss army rifle in absolute excellent condition, our own gunsmith machines and precision crowns barrel to 22" sporter length, remounts screws in sights, alters the hard mountain (red) walnut stock to sporter contours, rebeds barreled action perfectly, checks headspace, trigger pull (guar. light, crisp). Please return this gun for full refund if it is not perfect in every respect. Bores are perfect. A sporter for all big game. 12-shot bolt action repeater. Ammo: softnose hunting, 24 rds., $3.89.

MANNLICHER CARCANO CARBINE $12.95

6-SHOT BOLT ACTION

Here is the hardhitting, extremely accurate and powerful Carcano carbine, all milled parts. Built with famous Mannlicher action. Bores guaranteed good. Compact, fast handling, deadly on big game. 7.35 MM SOFTNOSE SPORTING AMMO, 20 rds., $2.85. Target ammo, 54 rds., $3.40.

TO ORDER ON FREE TRIAL: Send check, cash or money order. For C.O.D. send ½ or more deposit. All items F.O.B. Los Angeles Exp. charges collect. Calif. resid. add 4% state tax. Test, shoot, return in 10 days for full refund if not ideal in any and every respect.

THE ELLNER COMPANY

Dept. S3, 1206 Maple Avenue, Los Angeles 15, Calif.

ANOTHER OF INDUSTRY'S

MOST-WANTED MEN

Industrial Electronics Technician—knowledge of mathematics, drafting, basic electronics required. I.C.S. can help you master these subjects.

SEE SPECIAL OPPORTUNITY CHECK-LIST—PAGE 51

"TI-NEE" BATTERYLESS TUBELESS LIFETIME RADIO

"TI-NEE" RADIO IS GUARANTEED TO WORK FOR YOUR LIFETIME! USES NO TUBES, BATTERIES OR ELECTRICAL PLUG-INS. Never runs down! SMALLER THAN A PACK OF CIGARETTES! RECEIVES LOCAL RADIO STATIONS MOST ANYTIME, ANYWHERE WITHOUT EXTRA ANTENNA. Uses semi-conductor crystal diode Hi-Q Tuner. Beautiful black gold plastic cabinet. **Built-in Speakerphone.**

SEND ONLY $2.00 (bill, ck, mo) and pay postman $4.99 COD on arrival or send $6.99 for postpaid delivery. SENT COMPLETE READY TO LISTEN—NOTHING EXTRA TO BUY EVER! Extra long distance Aerial kit included free to receive stations up to 1,000 miles away. Available only from:

MIDWAY COMPANY, Dept. GPS-2, Kearney, Nebraska

EASIER FASTER BETTER!

KESTER METAL WORKER SOLDER

KESTER SOLDER

For General Soldering

FREE: "Soldering Simplified" 16-page booklet — Send for your copy today.

KESTER SOLDER COMPANY

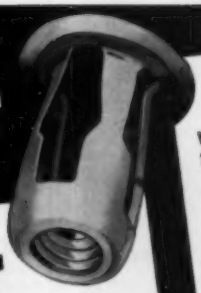
4234 Wrightwood Avenue • Chicago 39, Illinois, U.S.A.

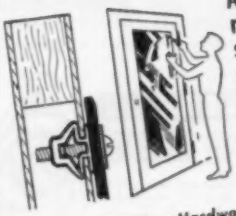
NOW...

Hang Fixtures Securely On Hollow-Core Flush Doors!

MOLLY

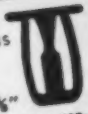
JACK NUT





At last you can hang mirrors, racks, shelves, kickplates, etc., securely on wood or metal hollow-core flush doors. Only ⅜" expansion space required. And the weight Jack Nuts will hold is limited only by the strength of the door.

ACTUAL SIZE OF 4S



WORKS IN EXPANSION SPACE AS SMALL AS ⅜"

...gives permanent anchorage, cannot pull through. Fixtures can be removed and replaced in same nut. Neat in appearance. Will not disfigure door or mar finish. Jack Nuts grip any material from 0" to ⅜" thick. As easy to install as A-B-C:

A DRILL HOLE AND INSERT JACK NUT.

B RUN IN SCREW UNTIL IT TURNS FAIRLY HARD.

C FIXTURE CAN BE REMOVED AND REPLACED IN SAME NUT.

- Only ¼ the size of the next smallest hollow wall fastener on the market.
- By the makers of famous Molly Screw Anchors.

Ask Your Hardware Man for Molly JACK NUTS

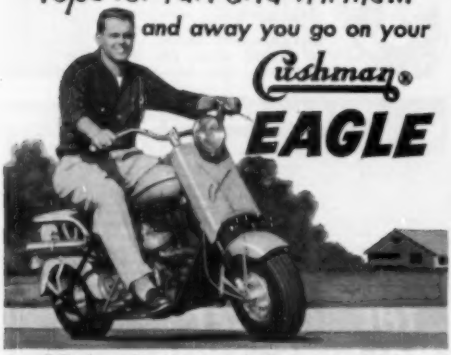
WRITE FOR FREE LITERATURE

MOLLY CORP. • READING, PA.

Tops for fun and thrills...

and away you go on your

Cushman® EAGLE



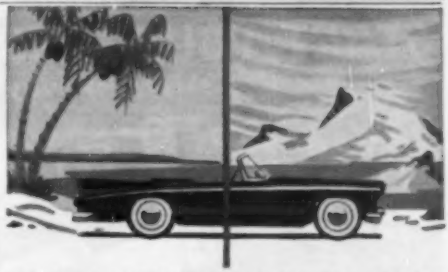
Offering distinctive design, a smooth soaring ride, and rugged construction. Powered by the famous Cushman Husky 4-cycle engine. Up to 50 miles per hour, up to 100 miles per gallon.

Ask your dealer for a FREE demonstration

Write for new FREE Booklet today

SOLD AND SERVICED NATIONALLY
Replacement parts immediately available
Dealer inquiries invited

CUSHMAN MOTOR WORKS, INC.
A subsidiary of Outboard Marine Corporation
974 NO. 21st, LINCOLN, NEBRASKA



TROPIC HEAT OR ARCTIC COLD YOU'LL START AND YOU'LL GO!

When a fuel pump has been tested under strict government supervision and found to work perfectly at 114 degrees above zero and at 76 degrees below zero, we think it has proved itself the best on the market. That's what the Bendix® Electric Fuel Pump did. Positively eliminates vapor lock. No other pump even close to its price class could match it. Better get one for your car. (Send for free illustrated folder.)

®REG. U.S. PAT. OFF.

Bendix

ELECTRIC FUEL PUMP

BENDIX AVIATION CORP. • (Eclipse Machine Div.), Elmira, N. Y.

BEAT HIGH BUILDING COSTS

Build a Liberty Home yourself ... or direct its construction

It's Easy to Save Thousands of Dollars

You save from $2000 to $5000 depending on the home you buy and the amount of work you do yourself. You save on material, contracting, labor costs; middleman's, architect's fees.

46 MODERN DESIGNS • Spacious 2, 3, 4 bedroom plans, 1, 1½ baths. Brick, siding or shake exteriors. Build with basement or utility room.

YOU GET finest quality *pre-cut* framing, finish lumber; nails, hardware, paint, windows, doors, roofing, siding, etc., complete plans.

ONLY 10% DOWN FINANCES MATERIALS

Send 50c for colorful, illustrated, 56-page catalog

LIBERTY HOMES

Lewis Manufacturing Co. • 1382 Lafayette Ave. • Bay City, Mich.
Enclosed is 50c for your big Liberty Homes Catalog

NAME _____

STREET or R.F.D. _____

CITY _____ STATE _____

START A BUSINESS *this quick way*

Sharpen Rotary Mower Blades with Foley 314 Grinder, also circular saws, skates, planer knives, scissors, shears, tools.

with FOLEY LAWN MOWER SHARPENER

"I have taken in 100 mowers in 5 weeks since I got my Foley,—with no advertising," says George C. Wise. "My machine has paid for itself in 2 months and everything I take in now is all profit"—from Otis Zacharia.

Here's a business you can start in spare time and begin to make a CASH PROFIT right away. The Foley handles up to 3 or 4 mowers per hour and prices run $2.00 to $3.00 for hand mowers, $5.00 to $8.00 for power mowers.

FREE BOOK shows how to sharpen power mowers. FREE PLAN tells how to start your own home business. Mail coupon today—no salesman will call.

FOLEY MFG. CO., 208-8 Foley Bldg., Minneapolis 18, Minn.
Send FREE PLAN on lawn mower business and Special Combination Money Saving Offer.

NAME _____

ADDRESS _____

ROSCO VEST POCKET .22—Brand new 6-shot German revolver that sells in the $28-$30 range. A tight accurate well-made piece. 3" Bbl., 5" overall. Fires popular Amer. made .22 short ammo. Side gate loading. Has a fine steel rifled barrel with blade front sight. Excellent for target or plinking. 10-day money-back guar. Nickel plated as shown $16.95. All Blue finish $14.95. For C.O.D. send $7.50 deposit. Leather holster $2.25. Send check, cash or M.O. to: SEAPORT TRADERS, INC., Dept. 97, 409 E. 12th St., Los Angeles 15, Calif.

DOOR ROLLERS ...

Hundreds of uses. As hardware for rolling or sliding doors, make work benches, tool chests, etc., portable 2" diam. ball bearing skate wheels mounted side by side on 1¾" x 4" shaft. ⅞" high. $2.00 retailer. Closing out at 89¢ each; 4 for $2.50; 100—$39.50. Prices FOB Houston. BARGAINS GALORE CATALOG 10¢

89¢

AERO PARTS SUPPLY, Municipal Airport, Houston 17, Texas

BARRON *Drill Press* TOOLS

Broaden the usefulness of your drill press with our Rotary Planer, Surface and Drum Sanders, Router and Mortising Bits Molding Cutters . . . other essential accessories. Complete catalog and price list mailed on request.

BARRON TOOL CO. INC.
320 Architects Bldg., Detroit 1, Mich.

WRITE FOR FREE WORKSHOP GUIDE

Now.. GET LONGER LIFE FOR YOUR BATTERY

Amazing "NEW LIFE" battery rejuvenator extends useful life of new or old batteries for many months. Use lights, heater, radio as much as you like. Get sure starts even in zero weather. NO RECHARGING NECESSARY! Money Back Guarantee. Use 1 box for 6 volt, 2 boxes for 12 volt batteries. Rush only $1.00 per box.

JSM PRODUCTS CO. 1118 CASTLETON RD., DEPT. 73 CLEVELAND 21, OHIO

THE 'POCKET' MACHINE SHOP

The all-purpose Plierench comes equipped with Universal gear-jaw. Tool made of chrome molly forged steel in gun metal finish. Form fit handle. Adjustable from 0" - 1½". Thousand pound pressure grip for bench-vise jobs on the spot. For mechanics, home handymen, plumbers, electricians, farmers. Pipe gear-jaw or Wire gear-jaw extra at $1.50 each. Carrier pouch free with purchase of Plierench and extra jaws. F.O.B. Chicago.

Two sizes:

7" 16 oz. (with Universal jaw) $7.50
8½" 20 oz. (with Universal jaw) $8.50

PLIERENCH COMPANY of AMERICA
4611 N. Ravenswood Avenue, Chicago 40, Illinois *Dept. P*

Offer Your Motorist-Friends

GUARANTEED Improvement

in MOTOR COMPRESSION

...PEP...and ECONOMY...

and MAKE UP TO $1,500.00 IN A MONTH

No matter how old your friends' cars are, **unconditionally guarantee** them astonishing increases in compression, gas mileage and oil saving, **even let them judge for themselves!** Amazing new product **backs you up** 100%, hands you opportunity to make big money.

Build Big-Profit REPEAT Business Spare Time With

NEW, IMPROVED BIGGER, BETTER **MOTOR OVERHAUL**

Folks try MOTOR OVERHAUL and re-order from you time and again. Fleet operators buy large quantities on daring "You-Be-The-Judge" Guarantee. Sensational Independent Laboratory Report proves that **only moments** after MOTOR OVERHAUL is added to engine oil, compression increases up to 58%, gas mileage up to 54%, oil-saving up to 900%. New larger size, still only $2.98; make up to $1.78 profit on each one. Now with oil-stabilizer Formula X-303 for faster cold-weather starts, cool engine in summer!

FREE! Tear Out This Ad NOW...

and rush it with your name, address for complete money-making plans, actual copy of sensational Lab Road Test Report, daring Guarantee . . . all FREE, no obligation.

POPE CHEMICAL CO., 224 W. Huron, Dept. D-4 Chicago 10, Ill.

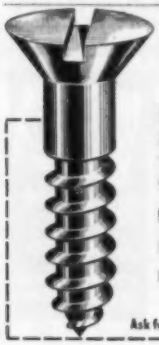
Heavy Duty, All Steel

TOOL CHEST

$25.90 F.O.B. ST. PAUL

WHERE ELSE can you get 4 drawers with *built-in locking system*, sliding on compound glides —at this price! Baked blue-gray enamel. 26" x 12½" x 12¼". Your money back if not satisfied! *Write for bulletin, describing this and 12 other models.*

HUOT MANUFACTURING CO.
532 No. Wheeler St., St. Paul 4, Minn.



Southern

SCREWS AND BOLTS CAN MAKE A

BIG DIFFERENCE

in the permanence and quality of your workshop projects.

QUALITY MAKES THE DIFFERENCE

BUY *Southern*

BUY 'EM BY THE NAME...

BUY 'EM BY THE BOX AND SAVE!

Ask for them at your hardware or building supply store

• TRY SUPERSHOP FREE
• WE PAY FREIGHT
• YOU BE THE JUDGE
• EASY PAY PLAN

• Why does Power Tools Inc. make such an unusual offer? Our business is manufacturing and selling power tools direct to people like yourself. We have had experience with hundreds of thousands of people regarding their home workshop requirements. Supershop meets these requirements. This has been proven.

The combination of direct selling, advanced design and efficient manufacturing enables us to give the greatest power tool value in America today. That is why we have the courage to make you this offer.

This free trial is truly free. The machine is prepaid to your door and if it does not satisfy you, you return it at our expense. If you keep Supershop you pay the low factory-to-you cash price — or easy payments to fit your budget.

Write for free information. Mail the handy coupon — or send a postcard. We'll mail you colorful brochures on Supershop — and full details on the FREE TRIAL HOME OFFER. Absolutely no obligation.

POWER TOOLS INC. 204 YATES AVE. BELOIT, WISCONSIN

POWER TOOLS INC • BELOIT, WIS.

Send me your FREE brochures on Supershop and complete information about the Free Home Trial Plan. I am under no obligation.

NAME_____

ADDRESS_____

CITY_____ STATE_____

Schupack's Amazing Tool Bargains! Save up to 100%!

ELECTRIC HAND GRINDER Fits in the palm of the hand and has an air-cooled motor that runs at 20,000 rpm AC or DC at 110 volts. Comes complete with both 3/32 and 1/8 inch Col-ets, cord and plug. **$11.50** P.P.

75 Mounted Wheels & Miniature Cutters. Regular $11.00 value **$4.50** Post-paid. For cutting and grinding on wood, metal or plastic. Includes 26 mtd. wheels and points on 3/32" shanks; 24 miniature cutters on 3/32" shanks; 25 short shank min. cutters. Will fit all electric drills and hand grinders.

FLEXIBLE SHAFT—ONLY $6.50 P.P. Fits all electric drills & hand power tools 42¾" long. Oilite bearings. Core of specially wound, high carbon steel wire in flexible steel casing. Will accommodate tool shafts up to 1/8" dia. For lathes, electric drills, etc.

2 DRUM SANDERS With 12 Bands in Assorted Grits. 1/8" dia. x 1" long on 1/8" arbor with 12 bands..... **$1.50** P.P. One drum, 1" dia. x 1" long on 1/4" arbor with 6 extra sleeves **$1.00** P.P.

8 Carbon Steel Wood Bits for Brace. Assorted sizes, 3/32" to 3/8", for drilling on wood or metal **$1.75** P.P.

15 Assorted Drills. From 1/16" to 1/2" high speed steel and carbon. Only **$3.95** P.P.

30 Assorted Drills hi-speed steel & carbon. Up to 1/4" dia. **$2.75** P.P.

10 HIGH SPEED STEEL REAMERS—Straight and Taper Shanks—all brand new and in excellent condition. Reg. $25.00 value. 10 for **$4.50** P.P.

12 Miniature Cutters. For cutting wood, plastic or metal. Assorted shapes on 3/32" shank **$1** P.P.

SPECIAL—100 PIECES for ELECTRIC GRINDERS Grinding Wheels, Cut-off Wheels, Sanding Discs, Mounted Stones, Honing Stones, Rotary Cutting Burrs, Mandrels and other items. **$1** P.P.

12 MOUNTED WHEELS and points on 1/8" Shank **$2.95** 25 for 7.50p.p. For grinding on plastic, wood, soft & hard metals. Regular Value $8.40. 18 Mounted points on 3/32" shank $2.50; 12 mtd. wheels on 1/8" shank $3.60.

ADAPTER CHUCK With 2 interchangeable collets, opening from 3/32" to 0, on 1/8" mandrel. **$1.50** P.P. Price each only. Adapter Chuck. From 60 to 80 on 3/32 in. Mandrel $1.00

7 H.S. and carbon drills from 6" to 12" in length. Assorted sizes up to 1/2" diam. for drilling in hard to reach places. A reg. $10.00 val. for only **$1.95** P.P.

7 Larger Drills. From 1/2" to 1-1/64". High speed steel and carbon..... **$7.50** P.P.

5 Woodworkers Drills. From 1/4" to 5/8" on 1/4" shanks..... **$1.95** P.P.

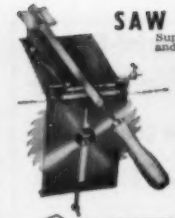
2 Circular saws. On 2 Mandrels—all at one low price. 1" diameter saws on 1/8" Mandrels. For cutting wood, plastic or soft metals **$1.50** P.P.

52 H.S. steel drills, threaded shanks from 3/32" to 1/4". Reg $9.50 value only..... **$2.00** P.P.

18 Rotary Cutters $5.85 P.P. Value $13.90. Assorted sizes cutter on 1/8" or 3/32" shank. Will fit all hand grinders. Ideal for cutting wood, metal, or plastic. Brand new.

No C.O.D.'s. Free Illus. Catalog

SCHUPACK SUPPLY CO 7331 COTTAGE GROVE AVE. DEPT S-72 CHICAGO 19, ILL.



SAW SHARPENING IS EASY

Super Filer No. 11 joints and sharpens hand and circular saws 6" to 10" with all teeth correct in height, depth, pitch, bevel. When file hits hardened steel roller, teeth are finished. Saw runs true with no side pull. Includes 8" file. **$9.95** PPD.

"TRU-CIRCLE" saw set automatically sets teeth at 10° or more. **$2.95** ppd.

DOWEL CENTERS Centers inscribe exact location for opposite holes. Pairs for 1/4", 3/8", 1/2" holes. **$1.00** ppd.

SUPER SAW FILER NO. 6 Automatically controls depth, angle, pitch for all saws. Precision made and calibrated. Use in any vise or clamp. Includes file. **$6.50** ppd.

MONEY BACK GUARANTEE—CATALOG FREE

D. McBURNEY, 5908 Hollywood Blvd., Hollywood 28, Cal., Dept. S-28

The Modern PLASTIC for lasting Home Repairs

PERMANENTLY mends cracks or holes in wood, tile, stone or plaster. Sticks and stays put—Does not chip, shrink or fall out. Easy to use. Economical. Mold it, chisel it, polish or paint it. The big 4-lb. can is obtainable from your lumber, paint or hardware dealer at $1.25; or will be shipped direct postpaid (in U. S.) for $1.50. Complete satisfaction guaranteed or your money refunded. Order now.

DONALD DURHAM CO.

Box 804-U Des Moines, Iowa

CLOGGED SEWERS?

CLEANED INSTANTLY SAVES PLUMBING BILLS—

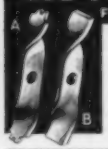
CHICAGO—Feb. 1st. Just introduced is a Free Booklet on a New Discovery which enables the Home Owner, Janitor, or Factory Maintenance to clean any Clogged Sewer Drain.

Yet anyone can operate this new **Plumbers Flushing Gun** which releases air pressure on a solid shaft of water cleaning the most stubborn stoppages up to 200 feet. TOILETS, SINKS, URINALS, BATHTUBS, FLOOR DRAINS, and HOUSE-TO-STREET SEWERS clogged with Grease, Rags, Sand, Roots, and paper melt away instantly when struck by the Hammer-like blow of this new unit.

There is no need to remove wall or pipe, or Grease Trap. A special attachment allows water to flow from the faucet through the Gun while air is released on the pipe. Vents or stacks are no obstacle, as force tends to strike wherever the water lays. But now, what is this Plumbers Flushing Gun worth in **COSTLY PLUMBING BILLS SAVED?** Tear this Ad out—and write your name and address beside it for **FREE BOOKLET.** Obey that urge. No agent will call. A postcard will do (Chicago Phone Kildare 5-1702) **MILLER SEWER ROD CO., DEPT. PS-F, 4640 N. Central Ave., Chicago 30, Illinois.**

USE YOUR BENCH SAW

FOR JOINTING & CUTTING MOULDINGS



With our six inch tool steel cutters you can make beautiful mouldings for picture frames, furniture, and house construction. Cutters as shown.

DIRECT FROM FACTORY!

One inch wide—$1.98; 1½ inch wide—$2.49 ea. Postpaid. Guaranteed. List & Folder free. State hole size.

JOHN A. SANDSTROM

Rt. 3 P. Clearwater, Fla.

READING GLASSES *that* MAGNIFY

WEAR THEM ON 10-DAY TRIAL

For those who need simple magnifying glasses only. Mighty helpful for most people over 40.

SEND NO MONEY

FREE CASE

Just name, address and sex. When glasses arrive, pay postman $2.95, plus small C.O.D. charge. Or send check or M. O. now for $2.95 and we pay postage. **SATISFACTION GUARANTEED,** or purchase price refunded promptly.

MODERN LENS CO., P. O. Box 92, Cooper Sta., N.Y.C. 3

When Writing to Advertisers Please Mention Popular Science

Trindl "ARC-TESTED" ARC WELDING

FREE WRITE FOR COMPLETE DETAILS AND EASY PAY PLAN

NOW! HOME CRAFTSMEN CAN OWN THIS PROFESSIONAL ARC WELDER

EASY TERMS ONLY $98.50 F.O.B.

Now you can own a Trindl full 125 amp Industrial Welder at a price far less than smaller machines. With a Trindl 125A you can weld metals up to ½ inch thick. Operates off either 110 or 220 volt line, properly wired. 16 heat stages from 20 to 125 amps. Make and repair anything of metal around the home, garage, farm or shop, like a professional. No previous experience or training needed. Full "do-it-yourself" instructions with each machine. Complete only $98.50 f.o.b. factory, or write for details. Trindl manufactures a complete line of heavy duty welding machines. Dealer inquiries invited.

TRINDL PRODUCTS Ltd., Dept. T3-B

1807 So. Clark St., Chicago 16, Ill.

Trindl "ARC-TESTED" ARC WELDING

Guaranteed 12 MONTHS IN CONTINUOUS OPERATION

Master direct-reading Caliper

0-4" SCALE

Measures:
DIAMETERS
THICKNESSES
ODD SHAPES

Measure any object up to 4 inches with this handy caliper and read the size directly on its precisely calibrated black-on-white scale marked in 32nd's. Squeezing handle opens caliper; a spring closes it. Narrow curved legs reach bottom of grooves and slots only 1/16 in. wide. Thumbscrew locks measurement for using caliper as a gauge. Indispensable to machinists, woodworkers, draftsmen, inspectors, hobbyists.

Buy at your hardware store or order direct. Money-back guarantee. Postpaid **$2.50**

MASTER Specialty Co. Inc.
3724 Monitor Ave., Minneapolis 26, Minn.

REVERSIBLE RATCHET DRILLS

CLOSEOUT BARGAIN $3.95

Regularly $25.10!

A super buy. Armstrong Standard sets including sleeve rachet for Morse taper shank, square taper socket and short spindle with feed screw—$3.95 Postpaid. CODs require $1.00 deposit.

Aero Parts Supply, Municipal Airport, Houston 17, Texas

ONE-MAN SAWMILL LOW AS $50.00 DOWN

Take BELSAW Portable Sawmill right to the trees—turn out valuable lumber for home and farm — sell to local yards — make up to $50 a day custom sawing for neighbors. BELSAW lasts a lifetime. No crew needed. Power with tractor or auto engine. Beginners get excellent results. Send today for FREE BOOK.

FREE BOOK

BELSAW MACHINERY CO.
3478 Field Bldg. Kansas City 11, Missouri

Buy U. S. Savings Bonds

America's Finest Cultivator
at anywhere near its small price!

Hummin'bird ROTO-HOE

only $109.50 complete

Now you can no longer afford to do hard spade and hoe work. This powerful (2½ h.p.) self-propelled tiller-cultivator makes gardening a pleasure! Has a beautiful self-propelled 22" twin-spindle rotary mower attachment you can hook on in seconds—for just $44.50; and the Safe-Speed Edger for only $27.50. Write today for free folder and nearest dealer's name.

ROTO-HOE, Dept. P-18, NEWBURY, OHIO

Built to Last

South Bend

13" and 14½" Lathes

Years mean nothing to these precision lathes, as they go on and on turning out accurate work at low cost with . . .

- Microfinished bearings with no metal-to-metal contact.
- Belt drive to spindle for vibration-free operation—no gear marks.
- Precision-cut gears and ground shafts for smooth power feeds.
- Rugged, rigid construction that will stand up under hard usage.
- Exacting workmanship by skilled craftsmen.

SPECIFICATIONS	13"	14½"
Swing over cross slide	7¾"	8¾"
Maximum collet capacity	1 1/16"	1 1/16"
Spindle speed range	20-940	15-875
Shipping weight, 7' bed	1760 lbs.	2089 lbs.
Base price	$1675	$2074

Write for FREE 80-page catalog.

SOUTH BEND LATHE
South Bend 22, Indiana
Builders of Lathes, Milling Machines, Shapers, Drill Presses, Pedestal Grinders

Up to 24 months to pay

[*Continued from page 129*]

an experienced teacher, with a passion to impart, drags or even tricks the student into comprehension."

Of course, impassioned teachers are rare in *any* kind of school. The correspondence people make a real effort to keep students interested, peppering them with brochures, newsletters, pep talks, as well as long personal letters and handwritten comments on exams.

With every lesson comes the examination, which looks like the tests you'd get in any other school. One difference: It's "open-book." You are encouraged to refer to the lesson while doing the exam.

Check a sample examination critically. It's one clue to the quality of the course. Ask yourself these questions:

- Will you have to understand the lesson thoroughly to complete it? Or is it nothing but a copying exercise?
- Will your answers have to be graded by a qualified instructor? Or could that job be done by a clerk?
- Does the examination help you learn more (by clarifying and emphasizing important points)? Or does it simply test what you have already learned?

Some schools use true-false or check-the-right-answer tests. Most often, though, you will have to solve problems and write out essay answers.

Who are the instructors? In ICS' Big Red Schoolhouse—and most other schools that teach a variety of subjects—they're women. They are high-school graduates who learn a subject by studying the same lessons you do. (This is not much different from the standard university practice of employing graduate students to correct undergraduate papers.) Some of them have spent 20 years or more on the job and have become highly expert in their particular fields, despite a frequent lack of practical experience in the work. Directing the instructors are several echelons of supervisors, many with outside experience both as teachers and as workers in the field they teach.

It's different at some of the bigger schools specializing in very technical subjects—electronics, particularly. There, every exam is corrected by a man who has both theoretical and practical knowledge in the field.

Some other unusual features of the ICS system stand out. Two examples:

- Your mistakes in grammar and spelling are meticulously corrected, no matter what course you are studying.
- You can't fail an exam. The worst grade is W—withheld. The exam is sent back for you to do over. There's no limit to the number of times this can happen; you just keep trying until you pass. Otherwise, ICS' grading is tough—you have to score 95 percent to rate an A, and at least 75 percent for a C, the lowest passing grade.

In some radio-TV schools, not only can you fail an exam, you can flunk out completely. Early in the course there is a point of no return. If you consistently fail the tests at that stage, you'll get a polite letter suggesting that you are not cut out for a career in TV repair. Usually your money will be refunded.

It's an honest man who will go through a dozen snapshots of himself without feeling the urge to tear up at least one.
—THE SIDEWALK SUPERINTENDENT

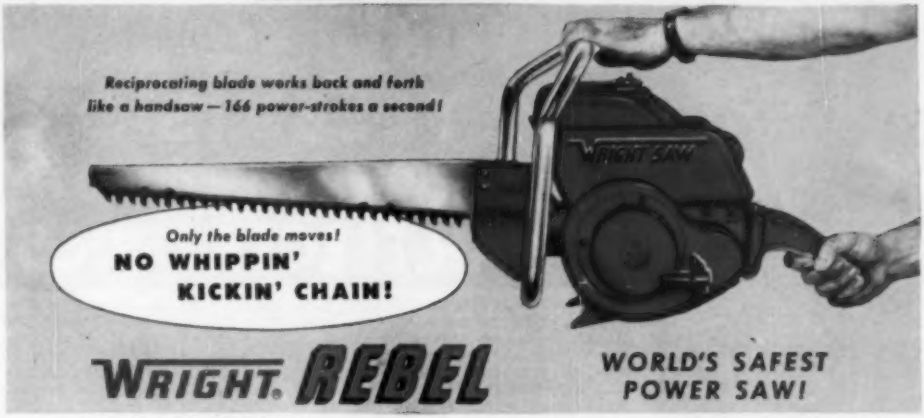
Who gets the diploma? If what we have said makes correspondence study seem like work, that's intentional. You'll have to devote the equivalent of an hour or two almost every night of the week, for a year or more, to get anywhere with a worthwhile course.

That's not easy for a young man with a family and a full-time job. Only one in five sticks it out to the end. (The attrition rate at regular colleges is somewhat better; about half of those who start graduate.)

But the rewards—that better job, more money—are there. Correspondence training is a popular and effective route ahead in such attractive fields as accounting, engineering, drafting, TV repair (one fourth of all Certified Public Accountants are the product of home study).

The number of students has doubled in the past decade, and will almost certainly double again in the next. This growth comes none too soon. In the titanic struggle for world leadership, America's greatest weapon is trained men—which are exactly what correspondence schools can produce. END

AMAZING NEW KIND OF POWER SAW



USE IT FOR DOZENS OF DIFFERENT JOBS!

Follow a chalkline without "wandering." You guide it and relax because the Wright *Rebel* feeds itself! Leaves a smooth mill-edge finish—the only power saw that does true precision-cutting!

Women or youngsters can do it! Neither strength nor skill is required to handle the lightweight, super-safe Wright Rebel. Smooth, self-feeding cutting action —with no whip, kick or grab!

Improve your property! Build a rustic fence; bridge a ravine; clear out shrubs and undergrowth; trim hedgerows; build a play house or garden "tea house." It's easy—and *fun*—with a Wright *Rebel*!

Totally *different* from any other gasoline-powered saw you've ever seen! Works on entirely different principle: reciprocating blade, *NO CHAIN!* So SAFE, so EASY to use for EVERY kind of outdoor sawing job—for farmers, hobbyists, outdoorsmen, nurserymen, orchard owners, right-of-way and park maintenance, pulpwood operators, etc. Drops trees up to 20" with a single cut—yet follows a chalkline and leaves a smooth mill-edge, for precision cutting. Costs less to operate and maintain. *Pays for itself* in just a few jobs!

$189.50

Includes 20" blade

F.O.B. Sheboygan, Wis.
Price applies in U.S. only

Dealerships available!

No other Power Saw does so MANY jobs!

- **Fells**
- **Limbs**
- **Bucks**
- **Undercuts**
- **Prunes**
- **Clears land**
- **Precision-cuts**
- **Leaves Mill-edge**
- **World's SAFEST Power Saw!**

THOMAS INDUSTRIES INC.
POWER SAW DIVISION
Executive Offices: 410 S. Third St., Louisville 2, Ky.

THOMAS INDUSTRIES INC. products: Moe Light and Star Light lighting fixtures...Wright power saws...Radiant opal glass...Ideal bathroom cabinets . . . Electric Sprayit paint spraying equipment

FREE DEMONSTRATION

See your local Wright Saw Dealer!

Send 10c for illustrated "Easy Steps to Woodcutting" booklet —shows dozens of do-it-yourself projects for fun and profit!

MAIL THIS COUPON TODAY!

Thomas Industries Inc., Power Saw Division
410 S. Third St., Louisville 2, Ky., Dept. 58-B

☐ I enclose 10¢ for handling and mailing illustrated "Easy Steps to Woodcutting" booklet—and full facts about the NEW Wright *Rebel* power saw.

☐ I am interested in becoming a dealer.

Name_____

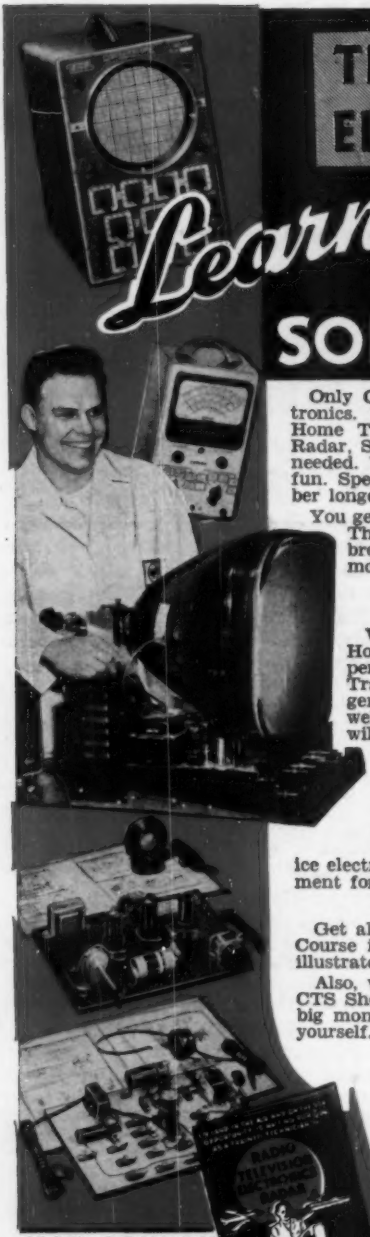
Address_____

City_____ Zone____ State_____

CAPITOL RECORDS Brings you this Amazing G
IF YOU AGREE TO BUY FOUR SELECTION

THE ONLY COMPLETE ELECTRONIC COURSE

Learn TELEVISION, RADIO, RADAR, SONAR, ELECTRONICS



Only CTS offers you *COMPLETE* training in all phases of Electronics. Why be satisfied with less? The new Christy Shop-Method Home Training makes learning interesting and easy. You learn Radar, Sonar, Electronics, Radio, Television. No previous experience needed. You learn by working with actual equipment. Makes learning fun. Speeds your progress. Helps you understand quicker and remember longer.

You get comprehensive training starting with your first CTS lesson! The complete knowledge CTS provides you with, gives you a broader knowledge, a greater understanding which will mean more jobs and a higher income for you for the rest of your life.

HOME LABORATORY SENT!
19 TRAINING INSTRUMENTS INCLUDED

With CTS *COMPLETE* Home Training Course, you receive a Home Laboratory to assemble, use and keep for years of peak performance. You receive a Multi-Tester, Oscillator, Signal Tracer, Oscilloscope, Signal Generator, Electronic Timer, Regenerative Radio, Giant-size Television Receiver (optional) as well as many other valuable electronic devices. With these you will be able to make hundreds upon hundreds of exciting experiments.

EARN WHILE YOU LEARN!
EARN $5.00—$6.00 PER HOUR

Or *MORE* while still studying! Almost from the very first you receive training that enables you to repair radios and television sets for friends and neighbors. To install and service electronic computers, communication equipment, protective equipment for police and fire departments, etc., etc.

FREE BOOK—SAMPLE LESSONS SENT

Get all there is to know about the Christy *COMPLETE* Electronic Course in Radio-Television-Radar-Sonar, etc. A complete, colorful, illustrated book on Electronics sent without obligation.

Also, we will send you Two sample lessons showing how the new CTS Shop-Method Home Training Course will train you for making big money in your spare time and for building a bright future for yourself.

CHRISTY TRADES SCHOOL, Dept. T-604, 4804 N. Kedzie Ave., Chicago 25

SIGN, MAIL FOR THREE BOOKS

MAIL COUPON TODAY FOR CATALOG!

Christy Trades School, Dept. T-604, 4804 N. Kedzie, Chicago 25, Ill.

Gentlemen:
Please send me, without cost or obligation, two *FREE* lessons and the new 24-Page illustrated book telling all about the CTS Master Shop Method Home Training Course in Radar, Sonar, Television, Radio and Electronics, and the many opportunities this new field offers.

Name..... Age.....

Address .....

City..... Zone.... State.....

CAPITOL RECORDS Brings you this Amazing Gift Offer:

IF YOU AGREE TO BUY FOUR SELECTIONS FROM THE CAPITOL RECORD CLUB IN THE NEXT YEAR

TAKE 3 FREE!

Capitol

12" LONG-PLAY HIGH FIDELITY BEST-SELLING ALBUMS

FRANK SINATRA Sinatra is torchy . . . mellow . . . rhythmic . . . amorous . . . in this magical album that reveals every side of his remarkable personality. Twelve all-time hits in "living" sound. Other Capitol hi-fi albums soon available to members include stars like Tennessee Ernie Ford, Gordon MacRae, The Four Freshmen, etc.

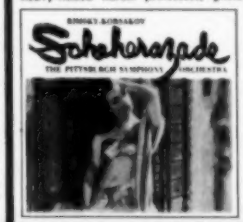
Yes, ANY 3 FREE

...to introduce you to the record club that brings you all the CAPITOL and Angel stars!

NAT 'KING' COLE Here is the man whose warm, pleasing voice sings of love—for all of those who know how sweet love can be! Twelve favorites including: *Annabelle, Dreams Can Tell a Lie, Never Let Me Go, To the Ends of the Earth, Too Young to Go Steady, I Just Found Out about Love,* etc.

GERSHWIN *Rhapsody in Blue* and *An American in Paris.* Music lovers around the world consider George Gershwin the greatest composer America has produced. Here is a special treat—Gershwin's two most famous compositions, brilliantly played by the Hollywood Bowl Symphony Orchestra with the piano virtuoso Leonard Pennario.

STOKOWSKI The world's most celebrated living conductor performs the outstanding LANDMARKS of his career—in rich new Full Dimensional Sound! Full-dress performances of works by Bach, Sibelius, Debussy and Strauss. (In the future Capitol will bring you other famous classical artists like Menuhin, Milstein, Leinsdorf, Golschmann, Firkusny.)



SCHEHERAZADE William Steinberg conducts the Pittsburgh Orchestra in Rimsky-Korsakov's fabulous tone poem that conjures up images of Oriental splendor . . . of heavy-lidded harem princesses, glistening Nubians, cruel Caliphs . . . and beautiful slave girls performing in exotic bazaars. A new and brilliant recording.

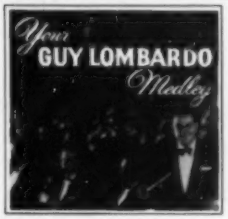
JUDY GARLAND Judy is that once-in-a-generation entertainer — and proves it, in this unusual album compounded of whimsy, passion — and just plain entertainment! *I Feel a Song Coming On, April Showers,* many others. (In Capitol's galaxy of recording stars, Judy shares top billing with such great girl singers as June Christy, Anna Maria Alberghetti, Jane Froman, etc.)

JACKIE GLEASON *Music to Remember Her.* This great showman knows how to produce music you love to listen to. Sixteen lovely ladies are portrayed in music, from *Stella by Starlight* to *Charmaine,* in a lush hi-fi album rich in memories and dreams.

RAY ANTHONY "Cheek-to-cheek" music . . . when lights are low and that special one is in your arms. *This Love of Mine, Embraceable You, September Song,* etc. Other Capitol albums feature Nelson Riddle, Paul Weston, Fred Waring, Glen Gray, etc.

THE KING AND I Here's the thrilling score from Rodgers & Hammerstein's hit musical! This original movie cast album stars Deborah Kerr and Yul Brynner. *Hello, Young Lovers; Shall We Dance?; Getting to Know You;* 11 others.

TENNESSEE ERNIE *Hymns* — that bring you peace and comfort . . . that warm your heart and revive cherished memories. 12 sacred songs, by a beloved singer; *Rock of Ages, My Task, The Old Rugged Cross, In the Garden, Sweet Hour of Prayer,* etc.



GUY LOMBARDO A huge helping of sheer listening and dancing perfection—by the band America has loved longest—and best. A full 40 tunes which span the memory-filled years from 1920 'til today. Satisfying music that you'll come back to again and again!

STAN KENTON The greatest in "progressive jazz"—*Lover, Peanut Vendor, Concerto to End All Concertos,* 11 others—recorded in "big" sound. As a member, you'll hear other Capitol jazz greats: Ellington, Harry James, Benny Goodman, etc.

HOW TO SAVE MONEY on the Albums you want . . . from the greatest of classics . . . to the biggest of hits!

1. YOU GET THREE ALBUMS FREE AT ONCE! Help yourself to ANY 3 of these 12" Capitol long-play albums. They are yours as a gift if you join the Capitol Record Club and agree to buy as few as four records during the coming year. As a Member you will have about 100 selections to choose from in the next 12 months—and you may resign, if you wish, any time after your fourth purchase.

2. THE GREATEST NAMES—THE GREATEST SOUND! Only the Capitol Record Club can boast such a list of stars. World-famous musicians and performers under *exclusive contract*—from the *latest* recordings of Stokowski to the *latest* Sinatra albums—are yours to enjoy in living high-fidelity. And Capitol's repertory of music — from the greatest classics to the newest hits and show tunes — are *all* reproduced in the "big sound" that has made Capitol the envy of the record industry.

3. FREE BONUS ALBUMS! For the records you decide to buy, you pay only the regular price—plus a small shipping charge. Albums retail at $3.98 or $4.98 and bills are payable 7 days after records are in your hands. Each time you purchase two additional records after your first four, you get a 12" long-play BONUS ALBUM *worth at least* $3.98 . . . absolutely FREE! It's just as if you were getting 50% interest on the money you invest in your record collection. You cut the cost of your records down to a fraction of the usual cost. Thus, you can give yourself and your family an even bigger record collection that will enrich their appreciation of fine music—today and in years to come.

4. UNLIMITED CHOICE! Enroll in any of the three divisions: Classical . . . Best-Seller Hits and Show Music . . . or Hi-Fi Jazz. Each month you'll receive a colorful and entertaining magazine which describes the current record selection of *each division,* and an alternate for each. If you want the selection of your division, you need do nothing. Or, if you prefer, you may order from any other division, or from Capitol's fabulous catalog of extra selections — ALL WITH FULL BONUS CREDIT. If you don't want a record that month, simply notify the Club on the form provided, and none will be sent. But hurry to get your THREE FREE albums right now—one is yours free for joining—the other two are a gift in advance of your first two bonus records.

5. NO RISK GUARANTEE! If not delighted, you simply return the three albums within 7 days and your membership will be cancelled. There is no other obligation.

Mail the coupon *immediately* to the Capitol Record Club, Dept. A-108, 100 Sixth Ave., New York 13, N.Y.

MAIL CARD TODAY! No postage required!

DETACH ALONG DOTTED LINES

Capitol

THE CAPITOL RECORD CLUB
Dept. A-108, 100 Sixth Avenue,
New York 13, N.Y.

Please send me at once the THREE ALBUMS I have checked below as a FREE GIFT.

☐ 1. Gershwin ☐ 5. Jackie Gleason ☐ 9. King and I
☐ 2. Stokowski ☐ 6. Stan Kenton ☐ 10. Nat King Cole
☐ 3. Judy Garland ☐ 7. Frank Sinatra ☐ 11. Tennessee Ernie
☐ 4. Guy Lombardo ☐ 8. Scheherazade ☐ 12. Ray Anthony

Also enroll me as a Member in the Capitol Record Club in the division checked below. As a Member I will receive—FREE—your monthly Capitol Record magazine describing the newest selections offered. You will also send me a printed form each month so that I may notify you whenever I do not wish the forthcoming selection of my division but prefer a selection from another division, or do not want any record at all. For each record I accept I will send you (7 days after receipt) the regular price plus a few cents for shipping.

I need buy no more than *four* records during my first year of membership (from 100 or more albums to be offered) and I am to receive a FREE BONUS ALBUM worth at least $3.98 EACH TIME I purchase two additional records after my first four purchases. If I wish, I may resign from the club after buying my four albums.

CHECK THE DIVISION IN WHICH YOU WISH TO BE ENROLLED

1 ☐ Best Seller Hit Albums (Dancing, Listening, Mood Music and Show Albums from Theatre, Screen and TV)
2 ☐ Classical Albums 3 ☐ Hi-Fi Jazz

NAME.....

ADDRESS.....

CITY.....ZONE.....STATE.....

IN CANADA: Put this card in an envelope and mail to: 1184 CASTLEFIELD AVE., TORONTO 10, ONT.

(Membership limited to one subscription per household)

PS-2

FREE!

THREE Capitol HI-FI 12" LONG-PLAY ALBUMS

If you join the Capitol Record Club now and agree to buy four selections from the club in the next year . . . out of 100 offered, featuring such great Capitol and Angel stars as:

STOKOWSKI ★ RAY ANTHONY ★ GEORGE SHEARING JOSE ITURBI ★ VON KARAJAN ★ OISTRAKH ★ JUDY GARLAND ★ GIESEKING ★ GUY LOMBARDO ★ CALLAS NAT "KING" COLE ★ GOLSCHMANN ★ LES BAXTER FRANK SINATRA ★ GILELS ★ SCHWARTZKOPF ★ JUNE CHRISTY ★ PEGGY LEE ★ GORDON JENKINS ★ FRED WARING ★ DOLORES GRAY ★ SIR THOMAS BEECHAM YEHUDI MENUHIN ★ DANNY KAYE ★ MANY MORE!

BUSINESS REPLY CARD
NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

5c POSTAGE WILL BE PAID BY

THE CAPITOL RECORD CLUB
Dept A-108, 100 Sixth Avenue
New York 13, N. Y.

FIRST CLASS
Permit No. 40999
NEW YORK, N. Y.

DETACH ALONG DOTTED LINES

performance out of this world...

STARFLITE V-4

with Evinrude's mighty V-4 power and magic "Seal of Silence"

For starry-eyed dreamers . . . Starflite is a dream come true! Its very name suggests performance out of this world. Its low, sweeping V-shape of tomorrow hints of fun to come.

You'll feel its solid take-hold power the moment you touch the throttle. Instant action! Remarkably quiet! Incredibly smooth!

Starflite's compact, perfectly balanced 90° V-engine floats on rubber mounts in a sound-tight nacelle. Power pulsations are wiped out. Engine noise is sealed in.

See the most remarkable outboard motor ever built . . . Evinrude's mighty 50 hp Starflite . . . *now* at your Evinrude dealer's. Look for his name under "Outboard Motors" in your phone book.

Thrilling V-4 performance is also yours in the new Four-Fifty, at low, low cost. There's a glamorous new Lark with Starflite quiet! Power-packed new "35's" and "18's" with key switch starting! A sweet-trolling streamlined "10"! And 3 handy take-along motors! Catalog *free*—write Evinrude Motors, 4222 N. 27th Street, Milwaukee 16, Wisconsin.

A Division of Outboard Marine Corporation
In Canada: Mfd. by Evinrude Motors, Peterborough

EVINRUDE ***quiet outboard motors***